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PACIFIC DISCOVERY

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PRE-DISCOVERY

THE ARCTIC has a fascination which is difficult to describe," writes Kaare Rodahl, M.D., in his book *North*. "He who has once watched the first sign of the returning sun in spring after months of almost complete darkness always longs to be back among those enormous wastes of ice and snow. Perhaps it is the same instinct that urges the migratory birds to leave the warmth of the southern sun every spring, and fly north to the magic nights of the Polar circle; or the same desire that once led our forefathers – the Norsemen – to leave behind all they possessed and the security of their native homesteads to explore and exploit unknown land beyond the barrier of frozen seas" (*North*, by Kaare Rodahl, M.D., Harper & Brothers, New York. 1953. xiv + 237 pp., 16 pp. photos, end-paper map. $3.50).

A lot of history lies back of the T-3 project of 1952, in which the Norwegian doctor, General William D. Old, USAF, *Life* photographer George Silk, and five others landed in a C-47 on an ice island pivoting around the Pole. "The existence of the frozen sea far to the north at the end of the earth was known to the ancient Greeks," Dr. Rodahl tells us. "Pytheas, the Greek from Massila [modern Marseilles], sailed through the Pillars of Hercules in the year 350 B.C. and continued on to the north. According to the legends he reached Iceland, which he named Thule, and may have seen the pack ice east of Greenland in the fog. The Vikings touched the fringes of the frozen sea on their early voyages in open wooden boats in the ninth and tenth centuries, and encountered nature in one of her fiercest moods." The "Skogar Saga" of this issue of *Pacific Discovery* has to do with Iceland, and is only peripheral to "the saga of the Central Polar Basin" (to use a phrase from the book in which Dr. Rodahl tells at first hand the story of the latest phase of Polar exploration against a background of the human and natural history of the Arctic). Yet it is a chapter, however minor, in the story of man's ceaseless effort not only to explore fully the ultimate North but to exploit arctic and subarctic resources for human use and living. *PD* went north with the special Alaska issue (May-June 1953 – "Skogar Saga" is as much an Alaska as an Iceland story), and will do so again. This book, *North*, and one entitled *The Mysterious North*, by Pierre Berton (Knopf, New York, 1956) which we shall review, can be recommended, among many fine volumes, as background or "further" reading, for when we go north.

PD'S AUTHORS

THE HISTORY of the early scientific explorers of the Pacific Northwest" is a special interest which took **Dr. Erwin F. Lange**, Portland State College professor of chemistry, from his home in West Linn, Oregon, to Astoria and the discovery of Chief Concomley's skull in the old Flavel House Museum. . . . ¶ Ann Arbor is to forestry professor **Dow V. Baxter** of the University of Michigan the apex of a triangle with one leg pointing to Alaska's Kenai Peninsula in the North Pacific and the other to Iceland in the North Atlantic. "Skogar Saga" as originally written in collaboration with Richard Zusi, one of Dr. Baxter's students, was a saga of birds as well as of forests in this triangle, but we had to leave that part for another story, Dick Zusi's. Dr. Baxter's base is the Laboratory of Pathology in Forest Practice at Michigan. . . . ¶ **Don Bleitz'** birds have added feathered beauty to *PD* almost from the beginning. From his dark room in Los Angeles Don goes out with specially designed equipment to get the last word in bird portraits. . . . **Philip Hyde** is a free-lance photographer and writer recently settled in Greenville, California. He was active in the campaign to save Dinosaur National Monument in which his photographs spoke with telling effect. Here he gives another part of the Dinosaur picture. . . . ¶ **Annette H. Richards'** interest in archeology took her to an underground story practically in her own Tucson back yard. Her other *PD* appearance (July-August 1955) was from far-away Monte Albán, Oaxaca. . . . ¶ Morrison Planetarium lecturer **Leon E. Salanave** can be reached for further questions via some sort of space communication device, we presume, later this summer – he will be on "Mars Patrol," atop southern California's Junipero Serra Peak. D.G.K.

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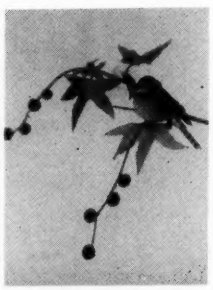

THE COVER

CHIPPING SPARROW on a California sycamore branch – one of the new bird portraits Don Bleitz is making by a special technique to eliminate confusing background (see pp. 15-17).

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EDITORIAL

sagas of discovery

SAGA: "A medieval story, historical or legendary or both, of an Icelandic hero or family," says our Merriam-Webster; or secondarily: "a modern epic-like narrative like an Icelandic saga." Derivation: Old Norse. The word as used by the title of an article in this issue of *Pacific Discovery* is but an echo; no saga follows, by any literal interpretation. And strange, isn't it, that our *PD* Roads to Discovery should lead to *Iceland?* So it seems, at first glance. Yet such roads – furrowed in strange seas, tracked upon new continents, or now vapored through higher and still higher reaches of atmosphere – mark in every age man's refusal to be bound by his visible horizon. Discovery is the breaking of bounds. Iceland was beyond bounds, a thousand years ago. Then overnight it became, not Ultima Thule but the jumping off point – for an unknown continent. The attempt to plot on the misted map of discovery this island, which is in the latitude of Fairbanks, Alaska and the longitude of westernmost Africa, takes us – if we would look back of beginnings – to man's earliest footsteps towards the horizon.

A footprint is scarcely less ephemeral than a wingbeat (although the tracks of men and dinosaurs have turned up, eons apart, in the fossil record.) The first travelers must be traced by whatever imperishables they dropped by the wayside or carried from here to there. In the first chapter, "Early Travel," of *Conquest by Man,* Paul Herrmann cites amazing evidence of Ice Age travel: "In 1903 prehistorians found at Font-de-Gaume in the Dordogne in France, the wall picture of a mighty old bison, a gigantic beast, drawn with great individuality. Twenty-three years later . . . a slab of slate was found 188 miles away . . . bearing the sketch from which the wall picture of Font-de-Gaume had been painted. . . . What can be deduced from the distance travelled by this . . . slab of stone is the fact that tens of thousands of years ago long journeys were undertaken in Europe."

How did it begin? "No doubt . . . with the tool" – with stone. "Wide areas of the land occupied by primitive man were, however, stoneless prairie, dense stoneless forest, reed-bed and marsh. . . . Hence anyone who could not pick up stones in his immediate vicinity was compelled to journey afar in search of them, compelled to acquire them by trade and purchase. So began the discovery of the earth." Stones, worked by human hands, have been found far from their native sites. Herrmann mentions flints, "easily recognizable by their special chemical composition," from a Baltic island, which have turned up in Switzerland. (Probably the oldest joke was one about a traveling salesman and a flint-chipper's daughter.) Baltic amber has been found in Egyptian tombs. The invention of bronze really put the drummers on the road. In fact, a Bronze Age box has been dug up which looks like nothing so much as a fitted sample case, complete with assorted cutlery and costume jewelry! (p. 38).

Barter brought roads, crisscrossing the continent, with sea lanes to Britain for tin, and the Mediterranean alive with sail. When did man first break out into the Atlantic? Long before our era, it may be; 200 years ago (1750) a storm-tide washed out of a beach in the Azores an earthen pot full of Carthaginian coins dating from the start of the fourth century B.C. (p. 82). So, we are told, men traveled far, wide – and early.

Mr. Herrmann's book is a history of world travel and discovery before Columbus – history in the broad sense, because it deals with a period short on trustworthy documents and long on legend and wild surmise, with a fair sprinkling of hardware in the soil which, however, gets very thin around the edges in proportion to the distance from Europe (the focus is on Western man; that longest of all hikes, from Siberia to Cape Horn, is another story). We'll leave for your own reading such intriguing items as the Lands of Punt and Prester John, and look with this and other authors to northeastern North America.

Bjarni Herjulfsson was the first man to cross the Atlantic (barring some possible sixth century Irish – St. Brendan figures here – alleged to have pulled a sort of Brodie and fetched up across the drink westward from the Old Sod; this is still another story, and a tall one, indeed – yet legends do persist in disclosing in time a hard core of truth, as we shall see). Now such a positive statement has meaning, under the circumstances, only in the absence of anything to controvert our understanding of one *saga,* Tale of the Greenlanders (in Icelandic, *Groenlendinga tháttr).* In other words, Bjarni Herjulfsson is the first person mentioned in a literary source as having sailed westward and sighted land which we identify as American. He sailed from Norway to Iceland, then trying to reach the Greenland settlements was driven too far southwestward by north winds. The first actual landing on our continent is attributed to Leif Eiríksson, who 14 years later followed Bjarni's careful sailing directions to make the same landfalls – quite a feat of seamanship.

The scholarly world has long since accepted the Iceland Sagas at face value as proof the Vikings found and for a time settled on the American mainland. But learned men still argue over the sea routes and landfalls. Where *was* Vinland? Markland? Straumfjord? Hóp? The best evidence we have for any particular places is that of the sagas – honest seafaring journals in the main – but *interpretation* of the same passages can take one author to Hudson Bay, another to New York Harbor! There is a bewildering array of books and articles to confuse the student; Edward Reman's *The Norse Discoveries and Explorations in America* and Frederick J. Pohl's *The Lost Discovery,* the titles at hand as we write, champion with equal vigor and honesty two wide-apart views. Both put Vinland on the New England coast – Reman at the Bay of Fundy; Pohl on the south side of Cape Cod. (Pohl had the ad-

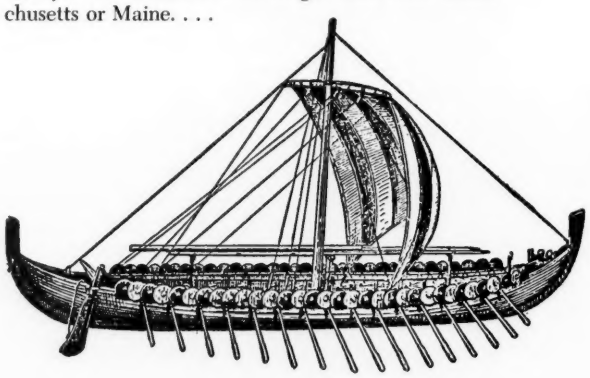
vantage of following the late Edward Reman into print; he has found what we agree is one serious flaw in Reman's reasoning – on the other hand, some of Pohl's strong points would have come in for the same treatment were the sequence reversed.)

But the chief issue between the two authors introduces the leader of the one serious Viking attempt on record to plant a colony in our land, the Icelander Thorfinn Karlsefni, as great a captain as Leif – if not as lucky. Here two sagas differ: the *Groenlendinga tháttr*, and the *Hauksbók* or Icelandic Version. Experts have tried to correlate them. Reman's interpretations put the locale of Karlsefni's three-year sojourn far from Vinland – on the western shores of Hudson Bay. Reconciling the differences, Pohl has the Icelander's large party stop at Leif's Vinland houses, then go on southwestward past Long Island to the mouth of the Hudson River – New York Harbor – and possibly farther south.

Where these Norsemen landed, tried to settle and keep their cattle, cut timber, fought Indians, and suffered hardship and famine may never be known. The fact is they did these things – the sagas are clear and trustworthy on deeds. But the sea is trackless; uncharted landfalls resist identification. Only physical relics would tell: none has been found to *certify* "this is the place." Why did settlement fail? One obvious and acceptable reason is that eleventh century Europeans had no weapons superior to those of the native inhabitants, who greatly outnumbered them. But in one way the Vikings succeeded: they found and exploited for generations a limitless reservoir of timber, one vital necessity of their way of life which neither Iceland nor Greenland could supply – and the mother country, Norway, was too far to be a dependable source. Iceland lived. But Greenland died, after four centuries of the gradual attrition of a life incredibly hard at best, and with its death ended Viking contact with America before Columbus.

The story that got us thinking on sagas of discovery is a story of forests, of timber for modern Iceland – American timber, now going eastward in seed packets instead of sawlogs or rough-hewn planks. The gap between the old sagas and the new may not be so wide as we would think. There is sufficient evidence for an intermittent flow of American timber to Greenland and Iceland down to at least 1347.

Enters now one of history's great enigmas. In 1898 a farmer dug up near Kensington, Minnesota, a stone inscribed with runes which said that eight Swedes and twenty-two Norwegians were there in the year 1362 "on exploration journey from Vinland to the West." The Kensington Stone is now in the Smithsonian, "cleared" by various specialists as genuine. Of our authors, Herrmann gives the most complete account of the events connected with and subsequent to this discovery; Pohl accepts and discusses it, believing it to have been left by the expedition of Paul Knutson whom King Magnus of Norway and Sweden commissioned in 1354 to go and restore the Christian faith to Greenland. Pohl's supposition is that Knutson found the Western Greenland settlement abandoned, so he set out westward across Davis Strait to search for possible survivors. Thence into Hudson Strait and Bay would have been a logical course. A glance at the map of North America shows easy water access to Minnesota via Nelson River and Lake Winnipeg. Reman, on the other hand, avers that "No one single object has ever been found on American soil which the voyagers of the eleventh century can possibly have made or left behind them." Yes, but what of the *fourteenth* century? In the same paragraph he dismissed the Minnesota "relic" along with all others claimed for the Norsemen. But Reman died in 1945; Professor Arthur G. Brodeur of the University of California edited and completed his manuscript. In summer 1948 the Kensington Stone was transferred to the Smithsonian (at about the time your editor was drafting the map for Reman's book.) Would Edward Reman have changed his mind about the Kensington Stone? We do not know, and have no right to presume it. Actually, it seems to us, the runic rock bolsters the Hudson's Bay theory – Minnesota is a far longer walk from Massachusetts or Maine. . . .



"Viking ship, sixth to eighth century A.D. Ships of this kind — very fast, seaworthy, but of such shallow draft that they could also be used on fairly small rivers — were for a long time the favourite Viking craft." (From *Conquest by Man*, courtesy Harper, New York)

It is very tempting to plunge deeper into the bracing North Atlantic waters here – to talk about the "mooring holes" Mr. Pohl has found in 'longshore rocks on the mainland side of Nantucket Sound, which are made and located just right for a *knarr* (Norse trading ship); to summarize the pros and cons of the Greenlandic and the Icelandic versions of the sagas; to follow, step by time-dimmed step with Reman, Karlsefni's forlorn but heroic assault of a continent; to be intrigued with Herrmann (while anthropolo-

gists aren't watching us) by early accounts of the Mandan Indians who advanced into the Minnesota and Dakota plains between 1350 and 1400 A.D., built flourishing towns, and puzzled French voyageurs and 19th century explorers alike by their civilized ways and un-Indian tendency to blondness, light skin, and blue eyes – but these waters of pure speculation have yet to yield something solid. The books invite your own armchair exploring.

WE MAY, if we will, quit the misty seas of legend, saga, and surmise, and take to the somewhat solid ground of more surely documented history. For rapid summary and orientation, we may turn to a concise little book, W. D. Hussey's *Discovery, Expansion and Empire,* which is soberly British in its review of ancient geographical knowledge, medieval travel, and the growth of learning and political power concentration, all of which laid the groundwork for the "Age of Discovery" – 1400-1600. This straightforward, factual text goes on to describe the results of discovery in Europe's bursting of its bounds and expansion into world dominance through colonies and then empires –we see how those two centuries of discovery changed the world and in turn sent it spinning to modern times with a drive it had never known.

With the frame set and outlines sharply drawn, we may be swept again into the full, rich detail of deeds and daring, of flesh and blood, of sweat and striving – the color, romance, and grandeur of Discovery – yet hold in view the design and context of history.

To pick it up where *Conquest by Man* left off, we find in *Worlds Beyond the Horizon* the track of discovery, the sea-wakes, land-traces, and vapor-trails of discoverers, from Columbus to the dreaming pioneers of space. In 1400 Europe's horizon was the ocean edge as seen from its shores; Viking exploits had drifted into the limbo of legend. Joachim G. Leithäuser's book takes us in prelude from the Phoenicians and Greeks to Prince Henry the "Navigator who never put to sea" but who devoted his life to winning for Portugal the sea-race to the Orient of silk and spice. First the oceans: the Atlantic yields to Columbus and draws Henry's captains – da Mina, Cao, Dias, da Gama, Cabral – by degrees southward to the rounding of Africa and the conquest of the Indian Ocean; Magellan leads westward to the first encircling; and Cook rounds out the Pacific. Next the continents: the Conquistadors open the Americas and a host of explorers follow – Ojeda, Balboa, Cortés, Pizarro, De Soto; Champlain, La Salle, Hudson, Mackenzie, Lewis and Clark; the naturalists in South America, La Condamine, Humboldt, and a new kind of discovery; Africa – Mungo Park, Stanley, Livingstone; Asia – "rediscovery," Marco Polo. Last the polar regions, Peary, Scott – and what is left but outer space?

All the great and familiar stories are here, framed in world-wide view, and brought into sharper focus by dwelling on the men who made them, their drives, conflicts, and personalities, their personal successes and failures, all with one thing in common: the refusing to be bound by the visible horizon.*

Since our emphasis in the first part of this discussion was on North America, it is fitting to conclude with mention of a book which tells the human story of our continent from the earliest we can guess of it, from that "hardware in the soil" – flint points and a meager scattering of such artifacts, – to the end of the Age of Discovery, 1600 A.D. This is Harold Lamb's *New Found World,* another tremendous book.

It begins with "that longest of all hikes, from Siberia," which did not stop till Cape Horn was in sight. This which we call the New World is as old, geologically, as "the three-fold land mass of Europe-Africa-Asia," but "human life came to it very late." It is science's best guess it came – that people came – by a land bridge from Siberia to Alaska, their successive waves spreading down the latitudes over several thousand years. But to evolving civilizations in the Old World, this was an "area of silence," it just didn't exist. The story of its discovery begins, then, with the first inkling to penetrate the rising stream of Old World civilization, of a land beyond the western ocean. From this beginning, *New Found World* traces the idea of a something beyond, in its growth from pure imagining or wishing-for, into the stunning reality of nothing less than half the world. The story of its discovery and exploration, and the subsequent grasp, by the mind, of it and the remaining unknowns of geography, perhaps constitute our greatest saga. D.G.K.

Conquest by Man. By Paul Herrmann. Translated from the German by Michael Bullock. Harper & Brothers, New York. 1954. xxiii + 455 pp., 57 halftones, 60 text figs., 31 maps. $6.00.

Worlds Beyond the Horizon. By Joachim G. Leithäuser. Translated from the German by Hugh Merrick. Alfred A. Knopf, New York. 1955. xvi + 412 + xvii (Index) pp., 599 halftones, 44 text figs., 17 maps and charts. $6.75.

Discovery, Expansion and Empire. By W. D. Hussey. Cambridge University Press, New York. 1954. ix + 131 pp. $1.25.

The Norse Discoveries and Explorations in America. By Edward Reman. Edited by Arthur G. Brodeur. University of California Press, Berkeley and Los Angeles. 1949. xi + 201 pp., map. $3.50.

The Lost Discovery: *Uncovering the Track of the Vikings in America.* By Frederick J. Pohl. W. W. Norton & Company, Inc., New York. 1952. 346 pp., 16 text figs. and maps. $3.75.

New Found World: *How North America Was Discovered & Explored.* By Harold Lamb. Mainstream of America Series. Doubleday & Company, Inc., Garden City, New York. 1955. 336 pp., frontis. and endpaper maps. $5.75.

**Worlds Beyond the Horizon* and *Conquest by Man* are both richly illustrated.

SCIENCE, SKULLS, AND SACRILEGE

A NEWS STORY *concerning the skull of Chief Concomley attracted our attention and that is how it happened that my family and I found ourselves taking turns squeezing onto the tiny dark stairway and into the dusty lookout tower of the historic Flavel House Museum in Astoria, Oregon, from which we could see for miles in almost any direction, particularly out to sea — out over the very waters where the great Chief had piloted ships of the Hudson's Bay Company. While downstairs, on the first floor of this beautiful old home, reposing in its glass case, was the strangely shaped skull of this same Indian Chief, come to rest after its weird travels and adventures. Behind all of this, we found an interesting and strange story.*

ERWIN F. LANGE

Clatsop County Historical Museum, Astoria, Oregon, where Chief Concomley's well-traveled skull finally rests in peace, is housed in the mansion built in the mid-1880s by Captain George Flavel who made his fortune in various enterprises.

MANY EARLY EXPLORERS of the Pacific Northwest wrote about the unusual customs of the Indians they found in this new land. Of particular interest to the scientific explorers was the practice among the Indian aristocracy of compressing the frontal lobe of infants so that the heads of adults appeared somewhat cone-like. This strange custom aroused a desire among the early scientists to secure a specimen skull which, they thought, would undoubtedly prove to be a prized scientific curiosity. But getting such a flattened skull was dangerous — the Indians frequently visited their dead relatives, and looked with contempt and anger on the white intruders who were so eager to desecrate their sacred burial grounds.

In April 1825 the first two scientists to explore extensively along the shores of the Columbia River and to become interested in Indian skulls arrived from England. These were Dr. John Scouler, naturalist and ship surgeon on the Hudson's Bay Company's *William and Anne*, and David Douglas, botanist, sent by the Horticultural Society of London. Scouler remained but a few months collecting zoölogical and botanical specimens; Douglas, whose name is today associated with the Northwest's most important lumbering tree, the Douglas fir, scoured much of what is now Oregon and Washington for new specimens during the next several years.

On September 20, 1825, Scouler's ship was on its return voyage down the Columbia when he left her to visit the hallowed burial grounds of the Chinook Indians; on this occasion he obtained two skulls which he took with him to England. At the burial grounds he found numerous canoes of the dead along the steep side of the river bank known as Mount Coffin. The canoes were covered with bark which was firmly tied with strong cords and held securely in place by large stones. Scouler found one somewhat decayed canoe containing a complete skeleton with many trinkets and ornaments of the deceased. As he was about to leave the burial place, the native Indians became aware of his activities and were angered that their consecrated grounds had been disturbed. With loud, enraged cries they followed him to the ship's side; a moment's delay would have cost him his life.

In 1829 when David Douglas was preparing for his second journey to the Pacific Northwest, he

wrote from London to a friend concerning the indignation of the natives, "I intend to procure the skulls of dogs, wolves, and bears for Scouler. But none of men, for fear he should make a second voyage to the Northwest coast and find mine bleached in some canoe, because I stole from the dead; as my old friends of the Columbia would say."

The first two scientists to travel across the American continent reached the lower Columbia in September 1834. These were Thomas Nuttall, naturalist, who resigned his position at Harvard University in order to accompany Nathaniel Wyeth on his second overland expedition, and J. Kirk Townsend, a young Philadelphia ornithologist. The experiences of the journey were recorded by Townsend in a delightful narrative of the expedition.

Townsend collected specimens of a large number of species of Western birds for the American Philosophical Society and the Academy of Natural Sciences of Philadelphia. His new species were described by Audubon in his famous work on American birds. He also obtained the flattened skulls of four Indians.

Townsend's first attempt to secure a skull resulted in failure. On this occasion he found a canoe about 14 feet above the ground in the branches of a tree. Knowing that it contained the body of an Indian, he examined it with the intention of removing the skull when he was surprised to find "a perfect embalmed body of a young female, in a state of preservation equal to any which I had seen from the Catacombs of the Thebes." Determined to acquire this body, he described his unusual experience in these words: "That night, at the witching hour of twelve, I furnished myself with a rope and launched a small canoe, which I paddled up against the current to a point opposite the mummy tree. Here I ran my canoe ashore, and removing my shoes and stockings, proceeded to the tree, which was about a hundred yards from the river, I ascended, and making the rope fast, around the body, lowered it gently to the ground; then arranging the fabric which had been displaced, as neatly as darkness allowed, I descended, and taking the body upon my shoulders bore

Burnby Bell of the Clatsop County (Oregon) Historical Society began the negotiations which brought the flattened and famous cranium back to the mouth of the Columbia, after its 117-year sojourn in England. (Photos, including Flavel House Museum, p. 4, courtesy of Mr. Bell)

Chinook Indian burial canoe. (Old drawing, courtesy Oregon Historical Society)

it to my canoe, and pushed off into the stream. On arriving at the fort (Williams on Sauvies Island) I deposited my prize in the store house, and sewed around it a large Indian mat, to give it the appearance of a bale of guns.

"Being on a visit to the fort, with Indians whom I had engaged to paddle my canoe, I thought it unsafe to take the mummy on board when I returned to Vancouver the next day, but left directions with Mr. Walke to stow it away under the hatches of a little schooner, which was running twice a week between the two forts."

Instead of the prized mummy, a note was delivered to Townsend explaining that an Indian had called at the fort and demanded the corpse. He was a brother of the deceased and visited the burial place every year and this time found the canoe of his dead sister empty. He knew the spoilers to have been white by the tracks upon the beach which did not incline inwards like those of an Indian. Mr. Walke surrendered the body and gave the Indian several blankets as gifts to prevent prejudice against the whites and wrote to Townsend that "the poor Indian took the body of his sister upon his shoulders, and as he walked away, grief got the better of his stoicism and the sound of his weeping was heard long after he had entered the forest."

On another occasion Townsend visited the burial grounds of the Indians and obtained the four skulls, and recounted the dangers accompanying such a mission: "I thought several times today, as I have often done in similar situations before: – now suppose an Indian were to step in here and see me groping among the bones of his fathers, and laying unhallowed hands upon the mouldering remains of his people, what should I say? – I know well what the Indian would do. He would instantly shoot me, unless I took the most effectual measures to prevent it; but could I have time allowed me to temporize a little, I could easily disarm his hostility and ensure his silence, by the offer of a shirt or blanket; but the difficulty in most cases would be, that in a paroxysm of rage he would put a bullet through your head and then goodbye temporizing. Luckily for my pursuits in this way, there are at present but few Indians here, and I do not, therefore, incur much risk; were it otherwise, there would be no little danger in these agressions."

At Fort Vancouver Nuttall and Townsend became acquainted with a young English physician

whose interest in compressed Indian skulls was to have the most far-reaching effects. This young doctor was Meredith Gairdner, sent by the Hudson's Bay Company to assist in combating epidemics and to serve as clerk at the Fort. Gairdner, who was well versed in botany and natural history, seemed delighted that his appointment to the Pacific Northwest would give him an opportunity to search for new scientific specimens. His sojourn along the Columbia was not as pleasant as he had anticipated, however. He had but little opportunity to engage in the natural sciences because of the many duties assigned him at the Fort. His difficulty was further vexed by extremely poor health.

Gairdner, like the other scientific investigators of the region, became interested in the possibility of securing a flattened skull to be sent back to England for study and exhibition. He did not seem to be interested in just any skull but decided on the compressed cranium of Concomley (this name had many different spellings in the early literature), chief of the confederacy of all the Chinook tribes along the lower Columbia.

Gairdner had heard many tales concerning the greatness of this Indian chief who was a friend of the whites and was visited and written about by many explorers of the region. Lewis and Clark in 1805 presented Concomley with a medal and flag. Washington Irving referred to him in a humorous vein as "a shrewd old savage with but one eye." Scouler in 1825 found Concomley in mourning because of the death of his two sons. Concomley's mourning consisted of putting on the oldest clothes he had, abstaining from washing, and continuing in that condition for 18 to 20 months.

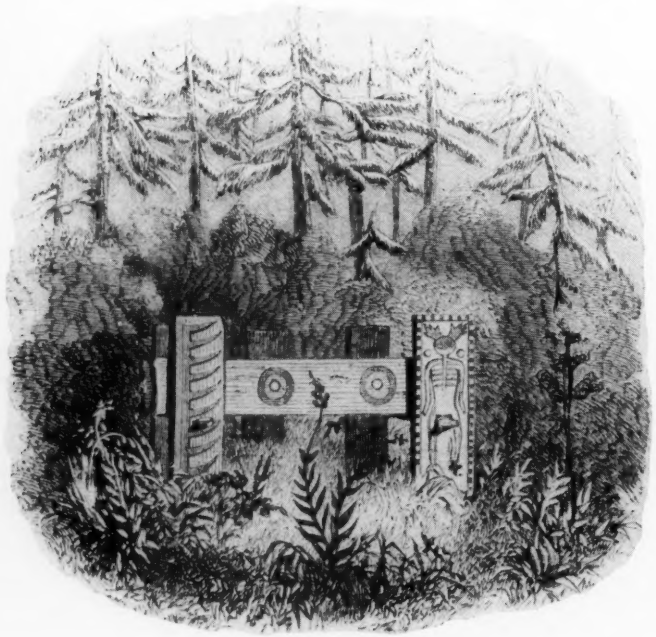
Because of Concomley's knowledge of the Columbia River he became the first river pilot for the ships of the Hudson's Bay Company. As soon as a ship crossed the bar, Concomley's slaves would paddle him in his royal canoe to the ship's side, and he would then guide it safely up the Columbia to Fort Vancouver. Concomley died in 1830 during an epidemic at about the age of 66.

In 1842 Concomley's grave was visited by members of the first United States Scientific Exploring Expedition. The commander, Lieutenant Charles Wilkes, recorded this event in his narrative and included a drawing of the grave.

Gairdner was quite sure that British scientists

Chinook woman with flattened skull and the next generation in press to produce the fashionable acquired characteristic — the "chipped off, like the old block," look. (From Catlin's *North American Indian*, 1841)

would be much interested in studying the skull of this unusual Indian to see if there were any indications which could explain his greatness. As Gairdner's health became worse, it seemed that only a warmer climate could help him. Thus, in 1835, he left the Columbia for the Sandwich (Hawaiian) Islands on the same ship with Thomas Nuttall. Like Scouler before him, Gairdner visited the burial grounds of the Chinooks at night and found that the body of Concomley had been removed from his canoe and had been buried in a grave. Very laboriously he dug up the grave and found the desiccated body of the Indian chief in a long box that served as a coffin. After much exertion he decapitated the bloodless body and in so doing he himself had a severe lung hemorrhage, thereby covering the dead body with his own blood. With his strength waning he completed his gruesome task and took the skull with him to the



Concomley's tomb. (Drawing, Wilkes' *Narrative*)

Islands; from there he forwarded it to England. He sent the specimen to Dr. John Richardson who later became chief medical officer of the Royal Naval Hospital near Portsmouth.

For 117 years the skull of Chief Concomley was exhibited in the Royal Naval Hospital Museum. During the bombings of England in 1941 by the German Luftwaffe the hospital was hit and many historic relics were destroyed, but the flattened skull survived all air attacks.

Late in 1952 Burnby Bell of the Clatsop County (Oregon) Historical Society began correspondence concerning the possibility of having the historic skull returned to Astoria, Oregon to have an honored place in the Flavel House Museum. In December word was received from Rear Admiral J. H. Hamilton, surgeon in charge of the Royal Naval Hospital, that the skull would be sent by mail. A few days later the newspapers along the Columbia announced the arrival of the famed skull. Accompanying the skull was a handwritten copy of Gairdner's original letter of transmittal sent from the Sandwich Islands to England.

The announcement of the arrival of the skull aroused the remnants of the Chinook Tribes. J. Grant Elliot, chairman of the revived Chinook Council, called a meeting of the descendants of Chief Concomley and stated for newspaper publication, "Our Chinook nation is entitled to the skull. Do you or any of your family want to donate a skull from your family as a specimen to satisfy the curiosity of the populace? Well, Indians are real people just as much as anyone else."

On January 18, 1953, over a hundred heirs of the Chief gathered at the small village of Skamakawa, Washington, in tribal council to determine the fate of the skull of the once mighty ruler of the lower Columbia. Attending the conclave was Burnby Bell, who convinced the Indians that the famed skull should rest in the Astoria Museum unless the Indians could establish a more fitting monument. Bell was voted an honorary member of the Chinooks, and the meeting ended with Chairman Elliot announcing, "Chief Concomley was a guest and good friend of the whites as well as the Indians. It is fitting that he should be honored in a white museum."

Thus, in the small city of Astoria at the mouth of the mighty Columbia, where Chief Concomley met Lewis and Clark and befriended the first American settlers at Fort Astoria, the skull, in finding a permanent resting place, begins the last chapter of an interesting history. It is the history of men risking their lives in treading upon the hallowed Indian grounds in order to obtain a specimen of a flattened skull. Today, the tourist may stop, as we did, to view the famous skull which has taken its place amid a collection of Indian relics.

DOW V. BAXTER

SKOGAR SAGA

THIS IS A BRIEF STORY of a journey to the forests of Iceland. We are following the progeny of the big Alaskan and western Canadian forests to the seed and transplant beds at Vaglaskogur, Hallormsstadur (pronounced Hat-lorm-shtath-ur), and Mulakot. "Out plantings," as Icelanders refer to trees set out in fields, are traced to these localities; and Haukadalur and Pórsmörk, too.

To Icelanders, these names are as functional and descriptive as Moose Pass, Copper Center, or Tin Can Creek where they collected Alaskan forest-tree seed for planting in the homeland. Haukadalur, for example, connotes Hauka (Hawk) Valley and Pórsmörk (Thorsmörk), Thor's forest. Even after the time of the god Thor, old saga writers described extensive birch forests in Icelandic valleys. Overcutting for charcoal, volcanic eruptions, a thousand years or more of grazing — followed by wind erosion — have all contributed to the barrenness of large present-day areas of this 40,000-square mile island with 144,000 people.

Tree seed, not only from Moose Pass, Copper Center, and Tin Can Creek, but also from many other Alaskan sites are now on the way to furnish shelterbelts for the Icelandic farmers, to help prevent wind erosion of the soil and dust bowls, and to furnish post timbers — subarctic forestry in our time. Skagway, Fairbanks, Lawing, Granite Creek, Seward, Homer, Eklutna Lake, and Anchorage are among the Alaskan contributors, as are other localities in British Columbia and Alberta. The effort has been to collect tree seed from climatic zones in Alaska that correspond to planting sites in Iceland.

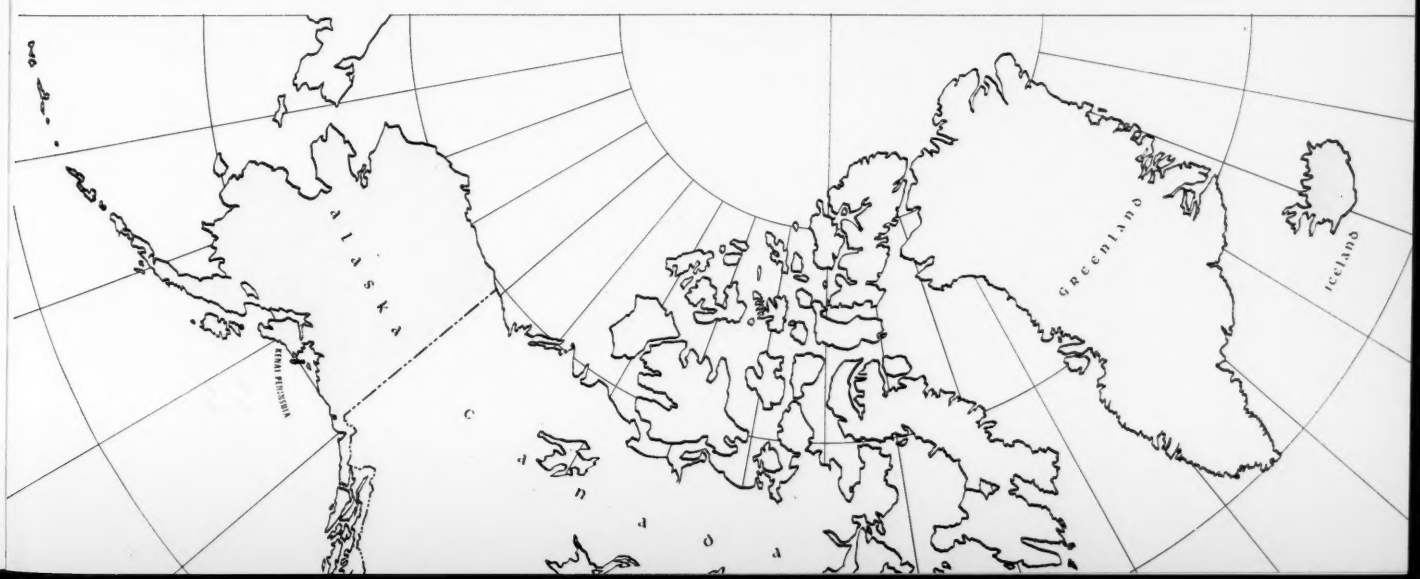
To reach the Icelandic valleys for planting, often near icecaps and milky rivers, we traveled chiefly by plane, jeep, and horse.

Preparations had been made for us by Iceland's forester to leave Reykjavik for tree planting projects at Mulakot. Fog was lifting and weather promised to be clear enough for views of Mount Hekla, which last erupted in 1947. Brynjar Skarphetinsson (Benny) would take us from Mulakot as far as a jeep could twist its way over boulders and lava and then we would transfer to horses for other plantings at Thorsmörk and within shadows of the icefield Eyjafjallajökull. Benny, as Alaskans called him when he was collecting lodgepole pine seed at Upper Dewey Lake, brought back plenty of welcome Alaskan atmosphere to the old country with him, even sporting a beaded belt reading "ALASKA."

"Just help yourself to some cod," he would add as he pointed to a dried fish on the floor of the jeep, at the same time giving a jab at the jeep for more power.

"Vi al lika fisk," we said in our best Scandinavian, which was neither Icelandic nor Danish. So we twisted and tore off a stringy tough scrap from the cod that tasted good.

Conversations centered about Alaska, Alaskan trees, the job of collecting Alaskan seed — and grazing, which is tremendously important to Iceland's economy. We talked, too, about the Alaskan poplar that one of us had seen at Mulakot in 1950. Pruned branches from these trees now serve as cuttings for additional stock, an excellent practice. The original trees are growing quite satisfactorily and the propa-



Balsam poplar from Kenai Peninsula, Alaska, at Mulakot, Iceland, 1950. (Dow V. Baxter)

The same planting, 1954. Prunings from these trees now serve as cuttings for other disease-free plantings. (Baxter)

gation of the disease-free plants from these Iceland-grown parents will avoid the possible introduction of poplar pests so prevalent in the States. Prevention of tree diseases by propagation of cuttings from present healthy foreign stock and confining new introductions to seed, places Iceland, because of its geographical isolation and present flora, in a unique position in the world with reference to the culture of exotic trees.

Hákon Bjarnason, the forester, practices what others have dreamed. His experiments with soil improvement before or during forest establishment bear watching, too. On the valley floors, the old braided river beds that are identical in aspect with those of Glacier Bay or those in front of the Mendenhall at Juneau, forester Bjarnason has inoculated his Icelandic soil – much as an Illinois farmer does before he plants legumes – and then Bjarnason sows or plants lupines *(Lupinus nootkatensis).* The blue blossoms of this legume from attractive Coopers Landing in Alaska – on the Kenai Peninsula – are now to be seen scattered among one-year-old poplar cuttings which also came from Kenai country. Soil improvement due to the lupine should be reflected in the response of the Alaskan trees. The fact that stock of both trees and nurse crop came from the same parent locality provides an ingenious study in plant introduction.

Remnants of birch forests which ancient sagas declare were extensive now constitute the only natural arborescent protective cover around Hallormsstadur and in other areas. In many of the sections of Iceland, fencing to keep out the sheep will result in the appearance of birch on the land. It's proof enough, we thought, that the forest once occupied more country than at present. Most of the birch wood itself is not over fifteen or twenty feet in height. When photographing the largest native tree in Iceland, we estimated it to be about thirty-five feet tall and seventy years old.

Since birch is noted for the large number and abundance of natural hybrids that occur within the genus, we made sketches of leaves, flowering branches, female catkins, and scales of the fruits in our notebook. Before long, we realized that hybridization in Icelandic birch was particularly common. We called most of the birch *Betula pubescens,* but variations existed including features characteristic of other species. Apparent hybrids that resembled the dwarf *B. nana* in many of the characters were abundant.

But these birch woods are important and are valuable even though they are merely sprouts from old roots. Prior to planting, an area is fenced for protection from sheep and then the natural birch are thinned to reduce competition to the exotic stock. Some trees are left to serve as protective cover. About five years later, additional thinnings are made to further accelerate growth of the planted conifers. There were about 1,200 to 1,500 birch per hactare (about 2.5 acres) left on one of the birch-Sitka spruce forests we were observing, but eventually all will be removed.

We marvel at the judgment of the Icelandic forester. He is forced to work in a country with few trees and with few species. Instead of attempting to nurse and cajole the existing brush, however, into forests more merchantable than now, he makes the birch serve as effective protection from wind for faster growing evergreens. And the lack of mortality among the trees in the mixture is testimony that the forester knows what he is doing.

Birch thinned from the natural woods to reduce direct competition from the conifers has value to the farmers for fuel and for fence post timbers. Actually, large numbers of present day fence posts are driftwood from Siberia! Steel posts are used, too, but they are expensive.

Kenai Lake, Alaska. Not far from here in the Chugach National Forest, ranges of coastal Sitka spruce and interior white spruce overlap. Here a hybrid cross between the two species has been recognized for many years but was not officially described until October 1953 as *Picea X lutzii* Little. Alaskan hybrids are being grown in Iceland.

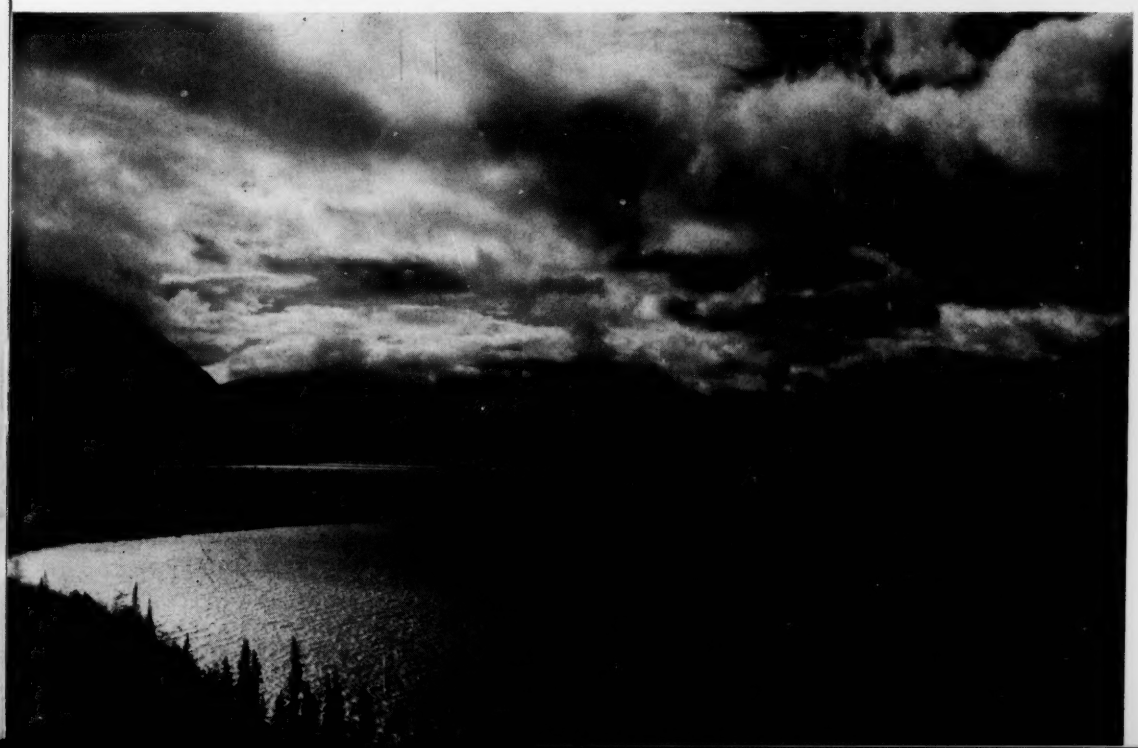
Undergrowth, such as this in an Alaskan Sitka spruce forest, is nowhere so lush in Iceland.

Many areas suitable for planting, however, have no natural cover. Therefore, before setting out conifers, birch is now being grown in nurseries for later cover-crop purposes. The native species, and even birch originating from Fairbanks, Alaska, is being tried. It is a healthy outlook for the future. Some stock obtained from different geographic sources already exhibits different responses to the new environment and there is, too, an apparent variation in resistance of Alaskan birch to the native birch rust fungus. As the disease was found in both native and Alaskan birch, tests need to be made to determine relative resistance of the two, but the Fairbanks seedlings were not as heavily infected as native stock at the time of our visit. Spraying of native birch against the fungus in the nursery is a necessary practice.

Some of the trees in the nursery will find their way into shelterbelts. Both land and buildings need protection from winds as strong as those of Oklahoma. Throughout our last day in the field at Haukadalur, the sky was yellow-brown with clouds of soil that had been whipped up from the farms. In winter, winds blow about, too, and buildings need protection from drifting snow.

Thinnings from shelterbelt plantings can be used for fence posts, and the shelterbelts give beauty to the barren landscape. (Icelanders are sensitive to beauty, as evidenced by the fact that so many are painters; we have never seen so many originals in oil as encountered in their houses.)

Shelterbelts in Iceland suggest those that have been established in our own plains country. In Iceland, the planting is apt to consist of a row of yellow willow, perhaps a row of the thingwillow, and a row of mountain ash – this last is the fastest-growing native. Variations in the arrangement of species in the shelterbelt



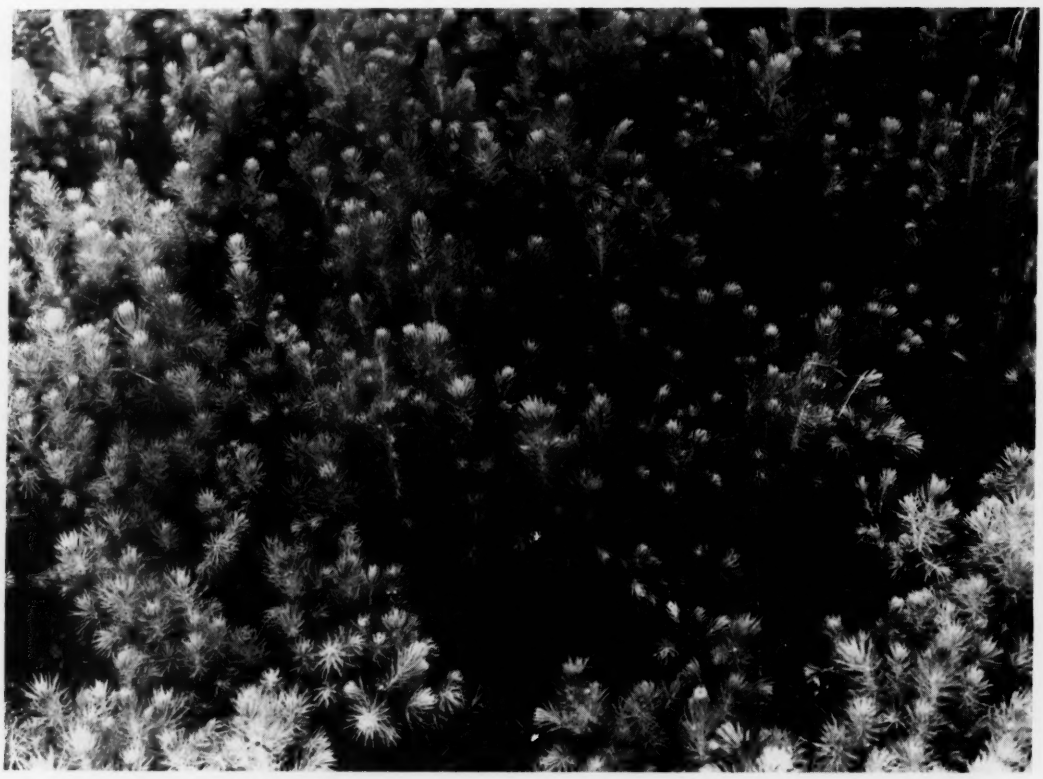
Dick Zusi inspects a good-sized Sitka spruce at Mulakot, Iceland, 1954. (Dow V. Baxter)

are to be expected and conifers such as Colorado blue spruce, Siberian larch, and others are often seen in the compositions.

In Icelandic nurseries, most of the trees grown are conifers. Alaskan seedlings, and especially Sitka spruce, are thriving. Western hemlock, mountain hemlock, Oregon alpine fir – species uncommon in our forest nurseries – are cultured successfully in Iceland. Some of the tree stock, too, has been transported almost as far as some of the birds have traveled to reach their Icelandic breeding ground. Engelmann spruce seed, for example, was originally obtained from Colorado, but sown first in Norway by foresters there and the seedlings later obtained from that country for transplanting in Iceland.

Have you ever had a surprise encounter with a plant found growing where it was least expected? Add to that thrill the feeling of having followed a completely new one half-way round the world to discover its being grown by the thousands – then our excitement upon meeting a newly-described Alaskan hybrid in Iceland is understandable. This attractive natural hybrid between the coastal Sitka spruce *(Picea sitchensis)* and the white spruce *(P. glauca)* from the Kenai Peninsula of Alaska was not officially recognized until October 1953. We would not know where to look for it in American nurseries.

It was back in the early thirties when one of us first



The newly described hybrid spruce, *Picea X lutzii* Little, from Alaska's Kenai Peninsula, growing in an Iceland nursery. Seed was planted during the cold summer of 1952, otherwise germination might have been better; nevertheless Scotch pine seed planted at the same time in Iceland did not germinate as well.

Lodgepole pine might well prove its worth in Iceland. Here at Hallormstadur stands a satisfactory planting from northern British Columbia's Cariboo Trail country (in the vicinity of Buckley, shown below). The pines were set out in the field in 1940 as five-year-olds (transplanted once in the nursery). Irregular height may be traced to competing natural birch cover which has since been removed.

Cariboo Trail country in British Columbia is a splendid breeding ground for birds as well as for seed to start Iceland's new forests.

ran across the native Alaskan parent hybrids while he was camping with two of his student colleagues among these trees not far from Moose Pass. He identified the magnificent whitish blue-green trees as Sitka spruce, but the boys (former students of his in dendrology!) reminded him that he had called the trees white spruce previously. The leaves were needle sharp, like those of the Sitka spruce, but the cones were the same size as those of white spruce and the cone scales were rounded, too. The scales, on the other hand, were paper-thin with toothed margins that suggested those of Sitka spruce.

Later, and at the first opportunity, he asked Mr. B. Frank Heintzleman, then regional forester and now governor, about the identity of these spruce. It was learned that Governor Heintzleman, too, had ques-

tioned whether they were either Sitka or white spruce. They must be hybrids, both agreed. In 1953, the U. S. Forest Service christened the hybrids *Picea* × *lutzii* Little in honor of Yale's Professor Lutz who made extensive specimen-collections of these trees. This new hybrid should grow well on some sites in Iceland.

Old World flavors are mixed with the newer contributions from frontier North America in the Icelandic nurseries and plantations. Siberian larch from Archangelsk, planted in 1938, was being thinned at the time of our visit. It was yielding fence post timbers! This larch is exceptionally well suited to the country and is now twice the height of blue and Engelmann spruce from Colorado of the same age. We would like to see the Dunkeld hybrid larch tested here, but would strongly recommend that stock be obtained from seed to avoid the possible introduction of the canker fungus. The Dunkeld hybrid itself is supposed to be resistant to the pest, but as the fungus attacks other larches, it is best to use every precaution to prevent its introduction. We did not find the canker disease on Siberian larch in Iceland. Because of Iceland's geographical isolation, foresters there have a unique opportunity to avoid bringing in many serious forest pests from both Europe and America.

A number of Scotch pine plantings (another Old World species), however, were being deformed and others killed by *Chermes pini.* Most of the stock we saw originated in Norway. As in America, some plantings of Scotch pine in Iceland at present are growing reasonably satisfactorily, some were well-formed and beautifully blue-green although slow in growth; but in general, early attempts at growing this tree have been disappointing.

American lodgepole – a close relative of the Scotch pine – might well prove its worth in Iceland, however. It is too early to predict whether Chermes and needle-cast diseases will be determining factors in its culture or not, but we were impressed with its present healthy condition.

The lodgepole pine there at Hallormsstadur, too, meant much more to us than just another plantation. We experienced the thrill of following a home-species to unexpected quarters of the globe. Back in 1952 en route to Alaska, we had traced our way over a twisted British Columbian trail they call the Cariboo. The trail pierced forests of lodgepole pine. Now to discover a promising plantation of this tree from stock originating along the Cariboo trail was reason enough for us to attach a rugged "personality" to each individual tree found at Hallormsstadur.

"We think this pine shows promise," our Icelandic forester advised.

"Better than lodgepole in Michigan," we emphasized. "Plantings of lodgepole in Michigan failed in our early reforestation program. The pine was attacked by a fungus." That this American pine can be grown in "barren-bleak" Iceland and not in our Michigan forest areas amazes many, but it's because of that ever-present disease factor that foresters face. We do not have any reindeer damage, though, and the reindeer had injured some few pine at Hallormsstadur.

Another satisfying surprise was experienced with plantation practices at Haukadalur. On our last day in the field we saddled horses and galloped off – through the heather and over the rocky countryside to see the Sitka spruce from Alaska's Copper River Valley. We were not amazed, frankly, at the gratifying and healthy growth of the Sitka spruce. We had come to expect it. As we rode further through the heath, a dust storm was blowing down the valley. We were accustomed to that too, but never previously had we experienced the feeling of being so close to a dust bowl in the far north. Often on our trip that afternoon, we would have to dismount, however, and lead our horses across small muskeg areas before resuming the trip through more heath and dwarf birch on higher ground. Finally we came upon a direct seeding project that climaxed our last hours in the field. Forester Bjarnason was riding ahead.

"Let's get off and look around," he suggested as he dismounted. Soon we found ourselves walking through birch brush to view the embryo forest developing in soil-scalped spots scattered over the hillside. Siberian larch, Sitka spruce, Norway spruce, and pine seedlings were growing in the spots. Since rodents have been largely responsible for the failures of direct seeding practices in the United States, we were all the more amazed at the success of this experiment in view of the fact that in Iceland mice are supposed to be "everywhere." They can't be everywhere, we felt, with successes of this magnitude. Perhaps we were judging rodent populations as we know them in planting areas of the United States.

This last day in the field alone supplied evidence of progress in this bold effort to plant conifers where they have never grown. We wished that every American interested in tree-culture might have the chance to see the heartening results that have been achieved with Alaskan trees when planted in similar climatic zones to those of the Territory. Their success underscores the importance of choosing species and sites, of site improvement, and planting care. For example, the original selection of fungus-free poplar stock was fortunate, and the present practice of obtaining future cuttings from Iceland-grown trees is wise. Because of the relative isolation in Iceland's past and its geographic position, together with the present awareness of the dangers of fungus introductions, Iceland can well become a model for the rest of the world in the practice of forest-disease prevention. This day in the field seemed to emphasize a program which could well serve as a standard to point up the benefits of sharing scientific knowledge and resources.

BIRDS AGAINST THE SKY

DON BLEITZ

Don Bleitz made these shots by a special method he has developed to give an all-"white" background, for easier identification in a book of Western birds he is preparing. These are red-filter color-separation shots. (ABOVE) Warbling vireo on paloverde blossoms; (CENTER PAGES) *left:* Anna hummingbird, male; *center:* orange-crowned warbler on wild cucumber; *right:* song sparrow, upper one on California sycamore; (FRONT COVER) chipping sparrow.

Philip Hyde DINOSAUR DIG

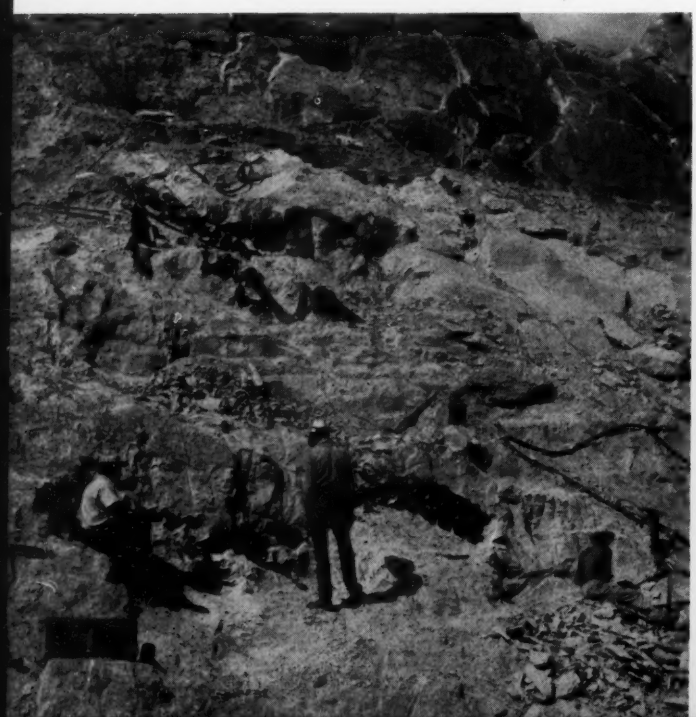
EARL DOUGLASS, paleontologist, roaming the semi-arid sand hills of northeastern Utah in 1909, was led by rumors and stories from cowhands to a row of Brontosaurus vertebrae which had been weathered out of the rock of the Morrison Formation. It was near the mouth of Split Mountain Canyon, in what is now the quarry section of Dinosaur National Monument. For 15 years, working under primitive conditions, but with the financial aid of the Carnegie Museum, Douglass laboriously chipped out fossil bones. His labors were so fruitful in fossils that they filled the Carnegie Museum and many others around the country. In 1915, being increasingly harrassed by souvenir hunters, Dr. Douglass was instrumental in getting President Wilson to set aside this first increment of Dinosaur National Monument by proclamation. The quarry languished until 1935, when work was again under way, this time by the W.P.A. During this period the initial plans for a museum were made, but further work was interrupted by the war. Visitors, after the war, were able to see a few traces that might be parts of the giant ancient reptiles; but to see a skeleton, they must journey to one of the museums, hundreds or thousands of miles from their last resting places here.

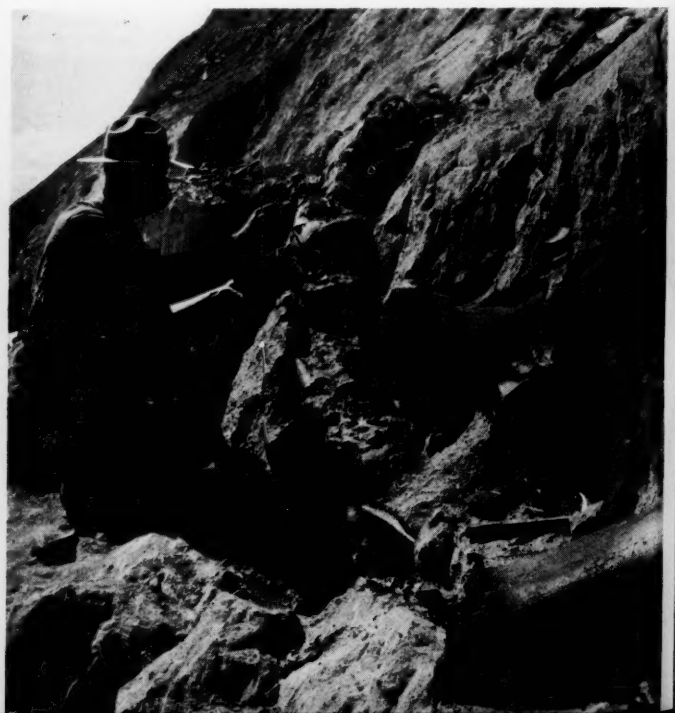
It was not until 1953 that the weathered rocks and crumbling shales of the quarry again heard the ring of excavating tools. In that year, with the public better informed about and more interested in the Monument – thanks to the controversy over the Echo Park dam proposed for a site in the river canyon upstream from the quarry – the Park Service got funds from Congress to investigate the stretch of fossil-bearing rock that had been left by previous excavations. Scientists were not sure what they would find there, but there was evidence that more fossils might turn up. In September of 1953, Dr. Ted White and his crew moved in to start the new excavation.

Dr. White is an old hand at this sort of thing, having collected fossils for a number of years in many fossil-bearing localities in the United States, Brazil, Cuba, and Panama. He came to the Park Service from six years with the Smithsonian Institution, where he took part in the salvage operation on sites in the Missouri Valley that would soon be inundated by reservoirs.

While directing the delicate and painstaking work of isolating the fossil bones from the surrounding rock, Dr. White, with his staff, is drafting plans for an in-place museum, which will be built directly over the quarry face to protect the exposed fossils. Present plans are for a two-story building with the quarry face, which stands at an angle of about 60 degrees from the horizontal, forming one two-story wall. On this "wall" fossil skeletons will be reliefed, in place. This exhibit will be developed to show the actual process of excavation, with a section of fully prepared fossils, then a partially developed section, followed by a third section, relatively little developed, with the various tools used in the work left pretty much as the workmen might have left them on going home for the weekend. Thus, the museum will not be just a dead display of fossil bones, but will give the impression that excavation is actually in progress.

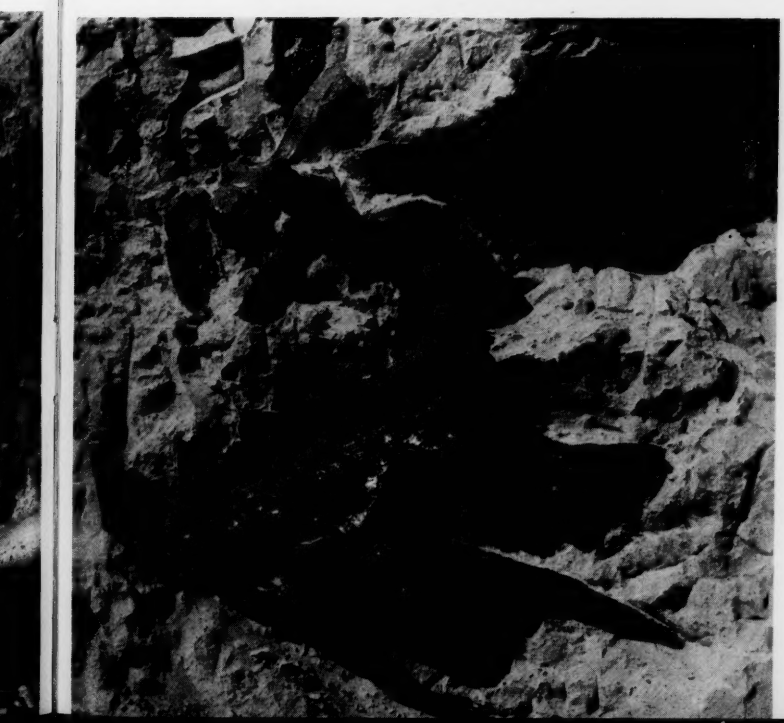
This should help to give visitors a sense of the





PHOTOS BY THE AUTHOR

Floyd Wilkins chips away pieces of the rock which has surrounded the Camarasaurus skeleton for about 150 million years. He is working on a neck vertebra. Parts of the skull and lower jaw may also be seen.



←(LEFT) The quarry face and dinosaur diggers — Dr. Ted White sitting at the left with a Camarasaurus skull and complete neck near his feet; Floyd Wilkins, standing; Frank McKnight, working, at the far right. On the ledge above them are six dorsal vertebrae. The rocks to the right at top of the picture are the exposed surface of a previously excavated fossil layer. (CENTER) Gil Stucker, one of Dr. White's assistants, applies shellac to vertebrae. The larger bones (darker forms) are part of the shoulder blade of Camarasaurus. (RIGHT) Close-up of the upper left jawbone of a Camarasaurus. The film box is about 3 inches long. This Camarasaurus skeleton will form part of the in-place exhibit at the quarry.

time and space continuum, of which both fossils and visitors are a part. It should also impress them with some of the intricate work necessary to find and isolate the fossils from their incasing rock. Tools used in this extremely interesting process run from the pneumatic jack-hammer familiar to sidewalk superintendents to fine-edged knives on the order of a surgeon's scalpel. The work is complicated by the fact that the fossils are sometimes hard to distinguish from the rock, and are extremely fragile, so that excavation must proceed with great care, and at a pace that would try the patience of any workman not personally interested in the work. Needless to say, the coarser abilities of the jack-hammer are used sparingly, and only in the upper layers of non-fossil bearing rock. Most of the rock chipping is done with hand tools.

Opposite this in-place quarry exhibit will be a mezzanine running the length of the proposed museum, situated so as to provide a good view of the in-place exhibit. Under this mezzanine will be a series of exhibits relating the Age of Dinosaurs with the rocks in which we now find their bones fossilized. In addition to this type of display there will be material describing the history and features of the rest of the Monument, of which the fossil quarry is actually only a small part.

Recently, the future museum was enriched by the unexpected finding of two Camarasaurus skeletons, embedded in the limy-clayey sandstone that was thought to be unproductive overburden. This is an especially notable find, as both skeletons appear to be complete with skulls – and skulls in this quarry have been rare. The characteristics of the rock in which one of these skeletons was embedded, however, made the excavation a particularly difficult problem, as it is highly susceptible to weathering and even simple exposure to the air, so that the blocks containing the fossil bones have had to be removed intact, and then carefully chipped and scraped away, while the bone material was being hardened by impregnation with preservative resins. Fortunately, the other Camarasaurus was embedded in a hard, dense sandstone, and it will form a part of the completed exhibit.

Recent news from Washington has been good. It indicates that the Park Service will probably get the necessary funds next year to carry through this interesting project that should do so much to better inform and to increase public enjoyment of this unique part of our National Park System.

HISTORY UNDER A PARKING LOT

ANNETTE H. RICHARDS

TUCSON, Arizona, on 9 December 1954 was just like any modern American city with Christmas coming – its metropolitan heart quickening to the rush of holiday shoppers. If by way of total contrast one should think of a lone archeologist digging a dead city in some remote place, he would be the more surprised to learn what was about to happen, on that date, in Tucson.

At Church and Washington streets a two-story house built in 1885 was torn down to make room for a parking lot. Right at this corner in 1926 the Daughters of the American Revolution had set up a marker at a point believed to be about 27 feet from the actual northeast corner of the wall of the Old Pueblo which settlers in 1776 had built to protect themselves from the Indians. Once 12 feet high, this presidio wall had disappeared so long ago that its precise location had become doubtful.

Tucson historian George Chambers, ever on the alert for facts of the city's past, now saw a chance to settle once and for all the exact position of the old presidio wall. Mr. Chambers went into action, just ahead of the bulldozers. Christmas rush or no, the parking lot could wait for history.

He called in two University of Arizona scientists, from the department of anthropology, Dr. Emil W. Haury, head (also director of the Arizona State Museum and soon* to become president of the American Anthropological Association), and Dr. Edward Danson. With the aid of three Ph.D. aspirants, Alan Olson, Earl Ingmanson, and Joel Shiner, Dr. Haury conducted two days of tests. On the second day, they discovered not only the presidio wall but also an old pit house underneath it. Finding the wall was news in itself, but the real excitement came from the much older pit house which in fact could be dated back to about 900 A.D. – it boasted an age of over 1,000 years.

The prospects of discovering whether the pit house site would produce evidence of continuous occupation since the year 900 was so promising that the archeologists dropped other less pressing matters and

*January 1956.—ED.

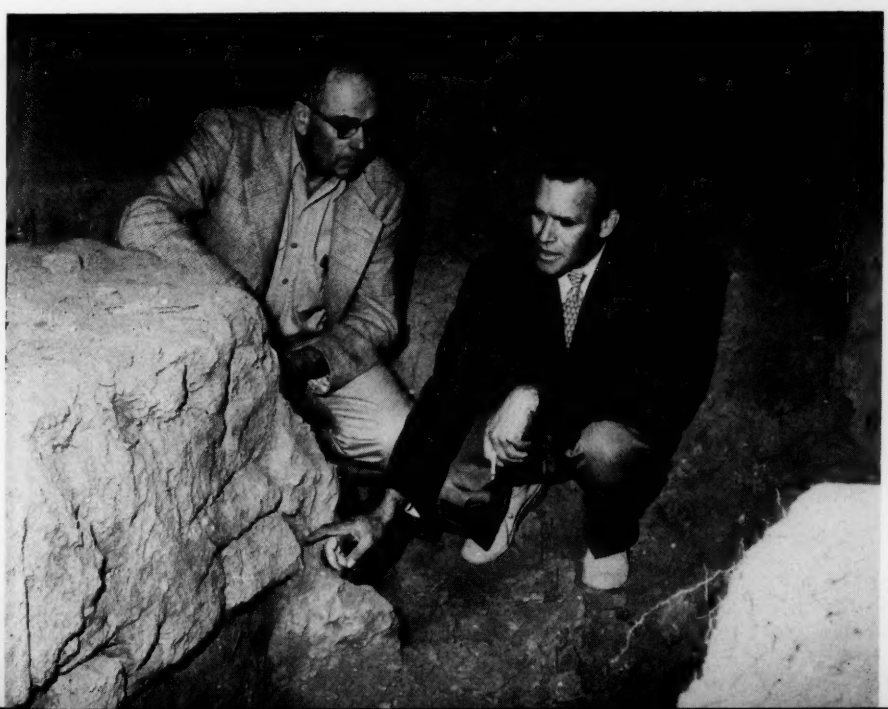
SCIENCE LOOKS INTO IT

tackled the excavation for two and a half weeks. Under the direction of "dig foreman" Alan Olson, the three students worked six days a week until December 29, taking off only Sundays and Christmas Day. Volunteers from both the university student body and from the town offered their services.

What was all the excitement about? Here was a challenge to the claims of St. Augustine, Florida, and of the Hopi village of Oraibi, Arizona, to the distinction of being the oldest continuously inhabited town or site in the United States! Perhaps in these diggings was evidence to outweigh the claims of these two other towns, evidence that might add considerably to our knowledge of early America, and of our predecessors, a people who can speak only through their houses and artifacts.

Gradually, an area 30 to 50 feet was excavated to a depth of three or four feet. In the center of the dig was the rectangular pit house of about 10 by 15 feet with potsherds definitely dating its use to 900 A.D. Artifacts on the different levels included, chronologically, part of a rusty Spanish spur, manos worn smooth from grinding grain, and pottery fragments dating all the way back to pre-pit house days. Soot and charcoal from ancient fires were found in the fire pit. There was evidence of the cave-in of the original pit house roof from fire.

These diggings differed from run-of-the-mill ones (if there are such!) in their city location, in their giving a hint of the life of pre-modern days on the very site of this same city, and in their clues of the depth of man's habitation of one favored spot. According to Dr. Haury, nothing essentially new archeologically was learned from this dig, although the exact location of the northeast corner of the old presidio wall was established correctly for the first time, thus substantiating what had been merely hunches before. The



(TOP) After test-digging and re-leveling of the Tucson parking lot site, archeologists started from scratch on 9 December 1954 in their search for the city's Old Pueblo wall. (MIDDLE) Beneath the wall, a dividend! Stripping the pit house are, *left to right:* Earl Ingmanson, James Barter (in white T-shirt), Alan Olson, and Joel Shiner. In the left rear is another volunteer, Frank Holzkamper. (Arizona State Museum photos) (BOTTOM) University of Arizona experts discuss the find: Dr. Edward Danson at right points out the last remaining layer of adobe bricks of the presidio wall to his Anthropology Department head, Dr. Emil W. Haury, who is also director of the Arizona State Museum. Dr. Haury directed this Tucson dig (Sutton photo by Lou Raizk)

important outcome of the venture was knowledge of the physical relationship between the Indian remains of the pit house below and the Spanish-American remains of the presidio wall directly above. It is the stratigraphic evidence that is significant. Pottery fragments of this pit house's vintage have been found before in the several square-block area originally enclosed by the presidio wall. But never before have archeologists found a pre-Spanish dwelling directly beneath a Spanish construction in this area.

Signs helped onlookers understand what they saw (rear sign wrong, was corrected!) (Arizona State Museum photo)

As you can imagine, an archeological dig in the center of town has many unusual problems. There is the inevitable confusion of recent construction with its leveling and digging. In this instance, the men found water lines and sewer mains. The sewer mains were in use so had to remain intact. The water lines, though carefully dug around at first, were found to be dead and so were hacksawed out and disposed of. However, they had partly destroyed the western limits of the pit house.

The advantages of a city dig are obvious. No expensive expedition had to be financed to a distant spot. The workers could live at home and still be handy to their work. Moreover, the choice central location enabled volunteers, both student and citizen, to offer their services without cost to the project. Being a stone's throw from the Tucson newspaper building assured this one of good publicity, almost daily reports keeping residents up to date on progress (however, some of the information thus disseminated was premature).

Because of its location, it became a sort of community project. Mr. Chambers collected donations from interested citizens to finance it. Gifts ranging from $5 to $200 totaled about $1,000 and covered the expenses. The Tucson Gas, Electric Light and Power Company loaned a ladder truck so that aerial photographs could be taken. The owners, John Mitchell and Sam Ward, the contractors, Griffith Paving Company, the lessee, Don Jones, Hayden Excavating Company, university students, businessmen and citizens all contributed in one way or another to its success.

Dr. Haury shot this aerial view from an elevation provided by a ladder truck. (Arizona State Museum photo)

The Tucson Gas, Electric Light and Power Company loaned the ladder truck for aerial photographs — Just one example of the civic-minded coöperation the archeologists enjoyed. (George Chambers)

This close-up aerial shot of the pit house — dig foreman Alan Olson is under the hat — shows the hard packed clay floor extending under the presidio wall. The extrance at the middle right of the pit house also lay underneath the same Spanish wall. The two large round holes were garbage pits dug down through the pit house floor since 1776. The two small round places above and below the larger garbage pit were post holes for pit house roof supports. Charred butts in them told the destruction of the pit house by fire. The small hole to the right of the large refuse pit is the pit house hearth. Supplementary posts forming the side walls of the pit house were also burned, leaving only charred butts along the bottom edges. (Arizona State Museum photo)

A unique opportunity presented itself at these diggings: the public could be reached first hand. Visitors came in droves. There was always an audience. The last few days there were never less than twenty or thirty onlookers. They hailed from Iowa, Massachusetts, New Jersey, Alabama, Oregon. They stood and watched by the hour and asked questions by the hundreds.

To facilitate their understanding and to save the time consumed in answering the main questions over and over again, a set of labels was put up to inform people which was the presidio wall of 1776, which was the 1,100-year-old pit house, etc. One Sunday, a crowd of people several deep on all sides of the excavation gathered to fire questions at the archeologists and to hear their answers. Interest was keen and questions showed real thought. Some queries, says Dr. Haury, made the archeologists stop and think, too! Beneficial as it was to the public, though, sometimes the sidewalk superintendents slowed down the work.

The crowd had a rare opportunity to see archeology at work, and took full advantage of it. The archeologists tried to meet this educational challenge and were rewarded in turn by the thought-provoking ideas of the visitors.

Further investigation of the site was indicated. But the owners, lessee and contractors, though generous in the delay of work on the parking lot, felt the press of time. The Tucson City Council entertained the idea of buying the site, finishing the diggings, setting up a house to protect them, and making the whole thing a city park or monument. But time was running out. The

December 29: Clarence Gravenor backfills; his boss, Julian Hayden, and his son, watch. (Author's photo)

contractors had to continue their work on the parking lot until something concrete was decided about the final disposition of the discovery.

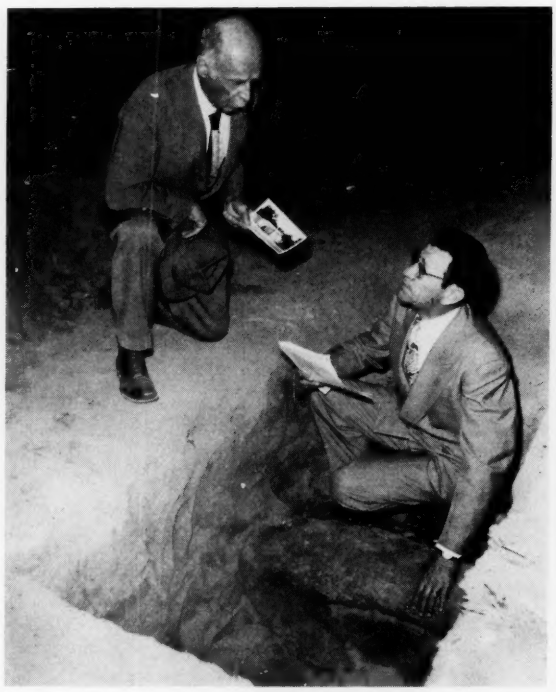
So on the morning of December 29, business won a temporary victory over history. It was a clear, sunny, nippy day. The site is in a border area including both private and business houses. The building permit tacked on to the foot-and-a-half cement block wall enclosing the future parking lot was a silent reminder that "the show must go on." Though the momentous discovery had been made less than three weeks before, it was all over now. As I arrived, clouds of dust filled the air. A payloader – tractor equipped with a shovel in front – was busily backfilling the excavation. Though the backfilling had started only about an hour earlier, the central pit house had already been interred. I stayed about an hour and a half watching the rapid but very careful backfilling. During that time a constant stream of people came by, watched a while, and left.

It was a sad occasion. It was almost as though we were all witnessing a funeral, the burying of something we were sorry to see go. Then I noticed something. Periodically the driver of the payloader would stop to consult with three men and a teen-age boy standing nearby. I approached the driver during a coffee break. His name was Clarence Gravenor. It seems that he is a specialist in a new art, that of speeding up the painstakingly slow and expensive but traditionally hand operation of archeological dirt moving by the use of power machinery, namely his payloader. Gravenor is no ordinary dirt mover. He is the fellow who speeded up the excavating at the Paloparado* site about fifty miles south of Tucson in the 1953-4 season by clearing the surface earth with his payloader, doing the heavy work quickly and efficiently and freeing the labors of the trained archeologists for the more detailed part of the excavations. He also assisted in moving the dirt the archeologists tossed on the edge of the dig out of their way, thus saving them from manually moving the dirt twice. And, as is the case with many diggings, he backfilled it after the archeologists were through. You see, many landowners require that the original level of the land surface be restored when the diggings are completed. Otherwise, cattle might fall in and break legs, or children might get hurt, etc. So, in the past year, Gravenor initiated the use of power machinery as a major factor in archeological diggings at this other site fifty miles distant.

Though he is no trained archeologist, talking with him proved that he had a serious interest in this work and knew just what he was doing. He pointed out one of the three men who were talking together and said that he was his boss, Julian Hayden, a former archeologist and excavator of the University of Arizona Indian Ruins. He now runs the excavating company employing Gravenor to do the backfilling. The boy with him was his son. Mr. Hayden was generous in the donation of his machine and its operator for this work.

A consultation between Gravenor, Hayden, and the two University of Arizona graduate students, Olson and Ingmanson, followed. Gravenor was filling in ex-

*Under the auspices of the Amerind Foundation and direction of Dr. Charles Di Peso.



Tucson businessman George Chambers, down in the dig, talks up the new discovery with a fellow member of the Arizona Pioneers Historical Society, Dr. R. H. Forbes. It was history-minded Mr. Chambers' interest in locating the northeast corner of the 1776 presidio wall that led to the finding of the A.D. 900 pit house. (Sutton photo by Lou Raizk)

pertly. There was one central mound he was careful not to knock over by too sudden and heavy a load of dirt. They were discussing how much to wet down the backfill at first. If it were dampened too much, it might become a quagmire and settle the loose dirt so it would harden too rapidly. This would make future reëxcavation very difficult and meanwhile make an unstable base for the parking lot. So care was to be used in the amount of water poured on at any one time in the settling of the loose earth.

I soon engaged the two graduate students in conversation. Clouds of dust enveloped us as the wind shifted. "Tucson housewives aren't going to love us," remarked Olson. What were all those newspapers lying on top of the different layers of the excavation doing, I asked. Each was weighted down with a couple of handfuls of dirt to anchor it from the wind. It looked messy, though there was a certain orderliness in their arrangement. In this dry climate and especially with paving on the surface, I was told these newspapers will last for five or ten years at least. If and when the place is reëxcavated, the newspapers will greatly facilitate the rapid and efficient removal of all dirt that is inconsequential – the backfill. Each paper marks the level which the excavation reached.

Also, it turned out, a mason jar was buried in the bottom of the fire pit in the pit house. It contains a complete set of newspaper clippings about this discovery together with a 1954 nickel and penny. So that if it is ever dug out by chance, here will be concrete evidence of its previous excavation in 1954 together with complete accounts of the dig.

Other precautions for future diggings have been taken. The archeologists have made a plane table map of the area. This, together with the work of the city surveyors, who located the dig in reference to city benchmarks, would enable the archeologists at any time to resurvey the site and actually to draw the outlines of the dig on the surface of the parking lot pavement with chalk and to know that they would be accurate to within half a foot.

An archeological dig in the heart of a modern city must deal with the pressures of the business world and of the high price of downtown real estate. Said Dr. Haury, "We archeologists work slowly – we can't compete with machines and time contracts."

Thus, though December 29 seemed a sad occasion, and it was, the archeologists are resourceful and forethoughtful. Though they dig up the past, they also look to the future. Perhaps in time, they will be free to finish the job that was interrupted. If and when this opportunity arises, they will be ready. In the meantime, they have put their discovery "on ice" – with skill, imagination and good grace.

In front of Alan Olson in the northeast part of the dig is a crushed vessel on an old floor pre-dating the pit house. The mound in the left foreground is a piece of the plaster wall of the pit house, which extends towards the left bottom corner of the picture. There is work left for a future dig, with the published record of this one to start from. (Arizona State Museum photo)

INTERNATIONAL MARS PATROL—*a new kind of Academy expedition*

MARS is the most interesting of the planets, from several points of view. While it never comes as close to us as Venus (35 vs. 26 million miles), Mars is better placed for observation at close approach, because the fully illuminated disc is turned toward us when the planet is opposite the sun and nearest the earth. When Venus is nearest, it is in conjunction with the sun, and therefore invisible.

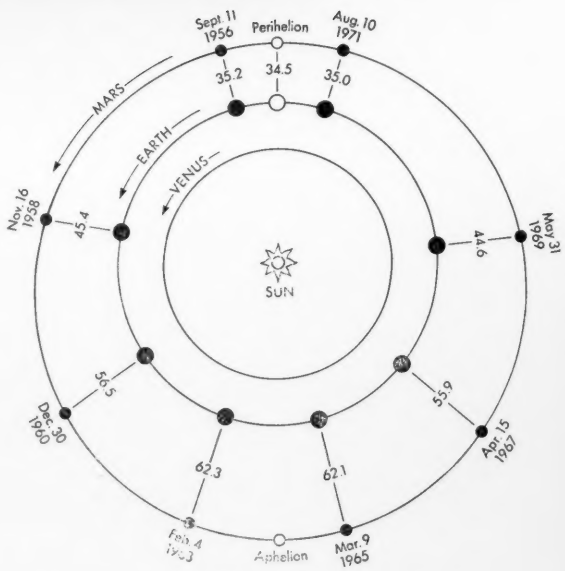
Mars has a thin atmosphere which allows us a clear view of surface details, while Venus, Jupiter, and Saturn are forever hidden under clouds. The Martian atmosphere is extremely thin (less than 10 per cent of earth's barometric pressure), and not of the same composition as our "air." But water vapor and carbon dioxide are present in minute amounts, giving support to the idea that some form of plant life may exist on the planet. This hypothesis is reinforced (but not proved) by definite seasonal changes in white polar caps and dark green equatorial patches which suggest plant growth.

Mars rotates on its axis in 24 hours, 37 minutes, and revolves about the sun in 687 of earth's days. Thus a Martian "day" is very much like ours, but its "year" is almost twice as long. The average distance from the sun to Mars is 142 million miles, or 50 per cent more than the earth's distance from the sun. As a consequence of this greater distance from the primary source of heat and light, Mars receives only a quarter as much radiation on each square mile of its surface. This fact is extremely important in evaluating Mars as an abode of life, for it leads to the conclusion that its average temperature is 100°F. lower than earth's. The thin, almost waterless Martian atmosphere has very little moderating effect on the day-to-night temperature change; a 100°F. drop might be expected in some places!

The diameter of Mars is approximately half that of the earth. At a distance of 50 million miles (an average when Mars is in opposition with the sun) the apparent disc of the planet is like that of a ping-pong ball 1,000 feet away. Small wonder it takes a good telescope and a sharp eye to make out the fine detail on its surface!

The earth's orbit is approximately circular, the distance to the sun varying from 91.5 million miles (in January) to 94.5 million miles (in July). But the variation from the sun to Mars is much greater. When

Mars — *left:* photograph with 36-inch reflector at Lick Observatory in 1941, showing white polar cap and pattern of light and dark markings identified with Mars. *Right:* drawing by R. J. Trumpler at Lick during the very favorable 1924 opposition. Fine lines, called *canals*, are clearly shown in some drawings but not in photographs — some astronomers question the reality of the "canal system."



The earth passes Mars approximately every 2 years and 2 months. If this occurs when Mars is near its *perihelion*, a very favorable *opposition* takes place — with Mars about 35 million miles from us. This will happen in September, this year, then not again until August 1971. (Distances are given in millions of miles.)

Mars is nearest the sun (*perihelion* – see diagram), the distance is 130 million miles. At *aphelion* it moves out to 156 million miles. The perihelion of Mars is opposite the earth's position during the last week of August. Thus an opposition occurring near this time presents the most favorable opportunity possible; this happened on August 23, 1924 and will not occur again in this century. However, from the point of view of near-minimum distance any opposition occurring during our summer months is considered good; then the planet's distance from the earth is between 35 and 40 million miles. During the opposition and close approach in early September, this year, Mars will be 35.2 million miles away – and will look like a ping-pong ball only 700 feet away!

Successive oppositions of Mars, at intervals of approximately 2 years and 2 months, are far from equally favorable for observation. Altitude on the meridian (i.e., maximum elevation in the sky) and distance from the earth are important variables. The greater an object's meridian altitude, the clearer it may generally be seen through our atmosphere, and of course if it is at the same time closer to us – better still. For observers in the north temperate zone, the favorable oppositions during July - September, at 15- or 17-year intervals, are poorly placed because Mars is then south of the equator and hence never high on the meridian. For this reason the Lowell Observatory, foremost in the study of the red planet, has manned the Lamont-Hussey Observatory at Bloemfontein in South Africa during the close oppositions of 1939 and 1954.

Observation of surface detail on Mars dates from 1659 when Christian Huygens sketched some faint markings and suggested a rotation period of 24 hours. This was a remarkable achievement with the imperfect telescopes of the time – especially since the opposition of that year occurred in December, with the planet 52 million miles away. There was a fairly close approach in October of 1610 – the year the telescope was invented – but Galileo never found more than the gibbous phases that occur before and after opposition. Huygens' improved optics pioneered the study of planetary detail.

During this century there have been a number of all-out efforts to learn more about the Martian surface and atmosphere, notably in 1924, 1926, 1939, 1941, and 1954. Lately, this endeavor has reached the level of international organization. Early in 1953, astronomers and others interested in planetary problems began to formulate plans for a world-wide program to coördinate observations of Mars during the favorable oppositions of 1954 and 1956. An "International Mars Committee," with headquarters at the Lowell Observatory in Arizona, was formed to organize the work of coöperating observatories and individuals all over the world and provide as complete a record as possible of Martian detail – especially by photography. From May through September of 1954, the coöperating observatories were the following: Pic du Midi, France; Lamont-Hussey, Union of South Africa; Helwan, Egypt; Kodaikanal, India; Bosscha, Java; National Observatory, Argentina; and Lowell Observatory, U.S.A. In addition, extensive series of photographs were obtained at the Lick and Mount Wilson observatories and at Palomar Mountain in this country. Also, several members of the American Association of Lunar

"X marks the spot" where the Academy's 12.5-inch Cassegrain reflector telescope will be set up to patrol Mars this summer. The Junipero Serra Peak Lookout tower is to the northwest. The relatively level chaparral and pine covered summit of this 5,862-foot California Coast Range peak should provide ideal seeing conditions.

The free and the fettered

The Tigers of Trengganu. By Lt. Col. A. Locke. Charles Scribner's Sons, New York. 1954. xiv + 191 pp., 38 photos, 2 maps. $3.50.

Lt. Colonel Locke of the British colonial military service was posted in Kemaman, Malay States, in January of 1949 and found that one of his important duties was protecting the native people and their livestock from miscreant tigers. Knowing nothing of tigers or their hunting he set out to learn. In the next four years he despatched 19 troublesome tigers, most of which were cattle-killers. Four were man-eaters. His accounts of the hunts are fully as spine-tingling as Jim Corbett's classic adventures recounted in *Man-eaters of Kumaon* (Oxford University Press, New York, 1946).

One of the valuable features of Locke's book is the authoritative account of tiger natural history. The author made a careful study of the normal habits of tigers and in Chapters 2 and 3 gives much good data on the lives and loves of these elusive beasts. Individual tigers, he found, maintain exclusive occupancy of local territories. Only during the mating season are territorial boundaries freely crossed. An average territory is 10 square miles in area. Knowing the territories of many individual tigers, Locke estimates a populaton of about 3,000 tigers in the Malay States. A relatively small proportion of the animals become troublesome. Most prey on wild pigs and hence are a distinct benefit to the people. On page 54 the author says:

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and Planetary Observers contributed fine sketches of Martian detail.

It is expected that in 1956 a greater number of organizations and individuals will join in this earthly assault on Mars. This company will include the California Academy of Sciences, which is placing a temporary observatory equipped with a 12.5-inch Cassegrain reflector atop Junipero Serra Peak in Monterey County.

Junipero Serra Peak has been visited three times in the past year with a view to exploring the astronomical potentialities of this very isolated 5,862-foot mountain.* The preliminary survey promises good seeing, an essential in planetary observations. Already a site has been chosen for our telescope (see photograph), and the foundation holes for the instrument mounting have been dug. Visual and photographic attachments, and a photoelectric photometer are being designed and constructed in the Academy's instrument shop. It is planned to have apparatus in place and ready to go by mid-July or early August at the latest.

The 12.5-inch telescope is not large enough to photograph fine Martian detail, but by shooting the disc of the planet through blue and red filters, sudden changes in the transparency of the planet's atmosphere can be detected. This puzzling phenomena, called the "blue clearing," will be the object of more exact measurements to be made with the photoelectric photometer. If the seeing from the Peak is as good as expected, it should be possible to magnify Mars 600 times or more and observe the formation and drift of clouds in its atmosphere. Such clouds, if detected, will be measured by filar micrometer with reference to the rotating surface of the planet, in order to gain information on the winds in the Martian atmosphere. Observers at the Academy's telescope will watch for the famous – and mysterious – "canals," but it is not expected that our comparatively small instrument will show anything new on that controversial subject.

The Academy has explored the land, the sea, and the air in its various expeditions throughout the years. Now we are going to the sky. From the Galápagos to Mars? Why not? L.E.S.

*See Astronomy, *PD*, July-August 1955.

Planetarium P. O.

IN THEIR ROLES *of curator and associate curator, respectively, of Astronomy at the California Academy of Sciences, the conductors of* PD's *Astronomy Department are called upon to answer inquiries from all over the nation, usually addressed to the Planetarium. The following is one recent example:*

MORRISON PLANETARIUM
SAN FRANCISCO, CALIFORNIA

DEAR SIR:

I would like to know you opinion on flying saucers and could you send me a list of information pertaining too the stares planets other than our own and their moons and could you tell me when you think the first rocket manned expedition will be made to the moon and then mars and do you think mars can support any type of life besides plant life and could you tell me if any planet other than our own and mars and could you tell me your opinion on the canals on mars (if they are canals) and could you send me a list of things that can be purchased from your book counter.

Look on other side

gratfully yours DAVID G. LINVILLE

Danville, Illinois.

DEAR DAVID:

Your letter containing questions would take too long to answer, but I am sending you a book list and I have checked three items in which you can find your questions answered.

I will say this much about flying saucers: Whatever people are seeing that they call "flying saucers," I do not believe they are inter-planetary space ships!

LEON E. SALANAVE, *Associate Curator*

Morrison Planetarium, San Francisco, 3 May 1956.

Star routes

Guide to the Stars. By Hector Macpherson. Philosophical Library, New York. 1955. x + 150 pp., 8 halftones; text figs. and charts; 6 constellation diagrams. $2.75.

The Prentice-Hall Book About the Stars. By H. Percy Wilkins. Prentice-Hall, Inc., New York. 1955. 151 pp., line drawings and charts. $2.75.

These two little books each give background for knowledge and understanding of the basic material of astronomy in laymen's language. Both authors are Fellows of the Royal Astronomical Society. Dr. Macpherson's is more for the adult reader and is more the guide to the visible night pattern of the sky, season by season. Dr. Wilkins' book should be more attractive to the youthful reader, as with others of the Prentice-Hall "Book About" series.

"I make no idle statement when I say that if the tiger became extinct, the damage wrought to agriculture by pigs in some parts of the Peninsula would rapidly assume formidable proportions." A.S.L.

Studies of the Psychology and Behavior of Captive Animals in Zoos and Circuses. By Dr. H. Hediger. Translated from the German by Geoffrey Sircom. Criterion Books, New York. 1955. 166 pp., 30 photos. $6.50.

Dr. Hediger is presently the Director of the Zoological Gardens of Zurich and Titular Professor of Animal Psychology and Biology at the University of Zurich. He is the author of a number of important scientific papers in the field of animal psychology. His many years of experience with animals in the wild as well as in captivity have provided him with a wealth of information which is incorporated into his present book.

Dr. Hediger rightly feels that any approach to the subject of psychology should be made from the comparative side just as the student of human anatomy begins with a study of the lower forms. The behavior of higher animals, especially mammals, whether it be concerned with fear of enemies, the relation of mother to offspring, or the play and training of young does not differ from that of human beings fundamentally but rather in degree of complexity. Hypnosis and dreams in animals are among the many fascinating subjects that are discussed. The former topic might be of interest to followers of Morey Bernstein.

R.T.O.

Dragons and hunters

A Manual of the Dragonflies of North America (*Anisoptera*): *Including the Greater Antilles and the Provinces of the Mexican Border.* By James G. Needham and Minter J. Westfall, Jr. University of California Press, Berkeley and Los Angeles. 1955. xii + 615 pp., frontispiece (color), 341 text figs. $12.50.

This is a complete treatment of all of the true dragonflies (not to be confused with the damselflies) occurring in the North American region. The introductory chapters will be useful to teachers and others seeking accurate general information on anatomy, biology, and methods of studying these insects. The bulk of the book, however, is of necessity a technical treatment of species. This features keys, a brief description of each species, literature references, illustrations of pertinent anatomical parts, full-length photographs of nymphs, and summaries of geographic distribution. The book is highly recommended to those requiring a definitive, authoritative reference on North American dragonflies. E.S.R.

The Hunting Wasp. By John Crompton. Houghton Mifflin Company, Boston. 1955. xiii + 240 pp. $3.00.

This is the latest of a long succession of popular books dealing with the fascinating habits of wasps. By means of a lively, highly anthropomorphic style of writing, the author has endeavored to project his subject without the aid of illustrations of any sort. In this he has shown considerable skill, yet a lack of illustrations is a very serious matter in a book whose intention is to introduce the habits of often-unfamiliar creatures to the lay reader. Modern photographic tools now render possible the production of vivid, true to life, close-up views of wasps in the very act of doing the wonderful things that wasps do. It is to be hoped that the next book on this subject will feature such pictures.

In spite of this deficiency, many readers will enjoy *The Hunting Wasp*. Perhaps it will stimulate many to delve into the book list cited by Mr. Crompton as the source of much of his information and then to go into the field and repeat the observations and perhaps even record new ones. E.S.R.

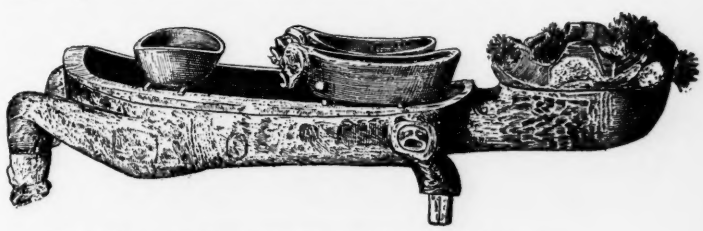
Oodles, noodles, and doodles

Indians of the Northwest Coast. By Philip Drucker. Anthropological Handbook Number Ten, published for The American Museum of Natural History. McGraw-Hill Book Company, Inc., New York. 1955. xii + 208 pp., 104 illus. in halftone and line. $5.75.

The subject of the lead article in this issue of *Pacific Discovery*, the skull of a famous Chinook Indian chief, exists to be written about — and gaped at in a museum — today, because of one of the curious Northwest Coast Indian customs of yesterday.

"Along the lower Columbia and northward, newly born infants' heads were flattened by binding a padded board at an angle against the forehead. This produced a wide, flat form of deformation, sometimes referred to as the 'Chinook' type, but also found among the Coast Salish. The Nootka and Kwakiutl used head pressers that produced an elongated, tapering head form, sometimes called the 'Koskimo' type, after the Kwakiutl tribe who carried this type of deformation to its most extreme form. A third variety, known as the 'Cowichan type,' was found among the Gulf of Georgia Salish, and was more or less intermediate between the other two forms. The northernmost tribes did not practice head deformation."

Thus Dr. Philip Drucker of the Bureau of American Ethnology, Smithsonian Institution, and formerly of the University of California, succinctly describes this among other aspects of the customs and material culture of one



Kwakiutl wooden feast dish. (From *Indians of the Northwest Coast*, courtesy McGraw-Hill Book Co., Inc., New York.)

of the most interesting and distinctive ethnic groups known in America — the *Indians of the Northwest Coast*. In this extremely attractive, compact, and well illustrated book (the drawings should be especially commended for their meticulous finish and emphasis on essential detail) the author has summarized for specialist and layman alike the facts of a highly evolved and in some ways unique way of life that has all but disappeared under the grinding onslaught of modern civilization.

Dr. Drucker points out that these tribes of the meeting-place of rain-forest and ocean developed a fabulously rich material culture and complex art style without benefit of the settled leisure that agriculture gives — these were hunters and fishermen. But they exploited their environment to the full: they hewed and carved wood, bone, horn; they decorated their artifacts with design that technically and artistically takes its place with the great art traditions of the world. This alone, to say nothing of their clan organization and the amazing *potlatch* system of social climbing and economic suicide, makes these Indians worth intensive study. D.G.K.

Mexico with good company

Mexico Revisited. By Erna Fergusson. Alfred A. Knopf, New York. 1955. 346 + iv (index) pp., 12 photos, 4 text maps, folded inset map. $5.00.

This review for *Pacific Discovery* should perhaps be introduced by the statement that the author of this book is an artist and diffuser of information rather than a scientific observer, but that is by no means a negative evaluation. Mexico is described as a sympathetic friend saw it on a recent trip made for the specific purpose of writing this report, and what is said is of interest even to those who know the country well.

Erna Fergusson is a good travel companion and she not only shares with the reader what she sees and knows about the country she depicts but her own personal reactions as well. She sees beauty everywhere yet she is not blind to the ugliness of injustice and human suffering. In a conversation which the reviewer had with her near the end of her stay we agreed that the major motivation of life in the country today is the drive towards material improvement in the lives of the people.

As might be expected of a resident of New Mexico, Miss Ferguson here approaches Old Mexico from the north and west — Chihuahua, Durango, and Zacatecas. Although these states are covered by the so-called "standard guides" it is a definite contribution to have the first-hand impressions of an experienced traveler who has recently visited this area, and the reviewer was moved more than ever before to know the state of Zacatecas and its capital better.

Interspersed with travel impressions are chapters on Madero, Mexico's ancient past, the Spanish Conquest, and the development of folk arts and popular industries. Personal anecdotes give life to each account and make the personalities presented seem very real. Although the reviewer feels that he knows Mexico pretty well, many new bits of information were found in these pages — repetition of the guide books is kept to a minimum.

Besides descriptions of places and persons there are brief accounts of a number of social and economic movements; and such projects as the Fundamental Education Training Center for Latin America at Pátzcuaro, Michoacán, the National Indian Institute Coördinating Center in Chiapas, and Catholic Action are explained.

Although this book is much more than simply another guide, it will nevertheless probably serve that purpose for many people; that being the case, perhaps it should have referred to some reliable sources of information on roads and places to stay. That suggests an appendix for a future printing — actually one is grateful that the chapters are not cluttered with such details.

Some excellent maps, drawn (except the inset map by R. W. Galvin) by the editor of *Pacific Discovery*, add to the value of the book. ROBERT CUBA JONES

Villa Jones, Chilpancingo 23, México, D.F.

Caribbean without cliches

The Trade Wind Islands. By Dane Chandos. Doubleday & Company, Inc., Garden City, New York. 256 pp., endpaper map. $3.75.

Nothing is more prone to clichés than the average travel book (unless it is the review of it). Dane Chandos steers as little by the cliché as any travel writer who comes to mind — and this goes for camera angles as well as turns of phrase. Indeed, *The Trade Wind Islands* is not only free of trite camera angles: it is quite free of photos! If this fact makes the travel-shelf browser pass on in haste to the next, perhaps handsomely illustrated book about the West Indies, his graphic gain might possibly be his literary loss.

This account, disarmingly casual in tone, of a tour through the Greater and the Lesser Antilles, from Havana to Port-of-Spain, with a side trip to Aruba and Curaçao and a final fade-out among the Yucatán Mayan ruins at Uxmal, is nowise *great* travel literature. But this reviewer's final thoughts on closing it after a casually intermittent — interrupted — reading may give something of a clue: No photos; a bit unusual for a travel book — but were they missed? Actually, no; the book is *full* of pictures, Dane Chandos' easy, flowing, vivid word pictures of places and the people that give places their particular color, taste, and meaning. The fervid vitality of a well churned and teeming island population — the constant trade wind from eastward must be bracing — which has here outfought and there endured a crumbling colonialism, matches the lusty tropic greens and volcanic ruggedness of much of the surf-bound landscape. The author has not, on the other hand, painted out the often somber ground of overcrowded, bare-subsistence living that underlies the surface color and quickly-kindled carnival gaiety.

A region and its river

The Pacific Northwest: *An Overall Appreciation.* Edited by Otis W. Freeman and Howard H. Martin. Second edition. John Wiley & Sons, Inc., New York; Chapman & Hall, Limited, London. 1954. xvi + 540 pp., 117 photos, 58 text maps and plans. $8.50.

If an extended trip or a move to the region embracing Oregon, Washington, Idaho, and western Montana is in prospect, for business, pleasure, or settlement, this book will be found the complete and ready source of geographical information. There are 30 contributors, mostly professors, with some in the Federal services. Twenty-seven chapters are grouped in five parts: Changing Human Adjustments; Physical Environment; Exploitation and Conservation of Natural Resources; Agriculture; Industry, Commerce, and Urban Development. Of special interest to many *PD* readers will be the chapters on Indian Life, Climates, and the nine of Part III which include Forests, Wildlife, and Recreation.

This is a large book filled with facts, sometimes in graphic form; but with the help of boldface subheads and the Index, the facts are easily located, and when you get where you want to go, you will find the text thoroughly readable as well as instructive.

Hail Columbia: *The Thirty-Year Struggle for Grand Coulee Dam.* By George Sundborg. The Macmillan Company, New York. 1954. xvii + 467 pp., endpaper map. $5.75.

This is the biography of an idea, the harnessing of "the greatest power stream in the civilized world," the Columbia River, and of the man who did the most to get the idea off the ground and into the reality of "the biggest thing all in one piece ever built by man," the Grand Coulee Dam in central Washington. The man — James O'Sullivan.

Like many big ideas, this one was slow coming. The Wenatchee *World* in 1919 quoted Jim O'Sullivan as declaring that the dam was "not only possible, but perfectly feasible." Ten years later this man who believed so strongly in the project was hired to spend the rest of his life campaigning for its realization. The building of the dam is familiar recent history; the part this one man played is the story back of history, and is therefore worth knowing, worth the exhaustive, fully documented job San Francisco-born George Sundborg has done in telling it.

A thousand pictures worth a million words?

Around the World in 1,000 Pictures: *A photographic encyclopedia of travel to foreign lands.* Edited by A. Milton Runyon and Vilma F. Bergane. Foreword by Richard Joseph; 10 maps by Rafael Palacios. Doubleday & Company, Inc., Garden City, New York. 1954. 447 pp., endpaper photos in full color. $4.95.

Around the U.S.A. in 1,000 Pictures: *A photographic encyclopedia of travel in the United States.* Edited by A. Milton Runyon and Vilma F. Bergane. Foreword by Paul J. C. Friedlander; 10 maps drawn by Rafael Palacios. Nelson Doubleday & Company, Inc., Garden City, New York. 1955. 384 pp., endpaper photos in full color. $5.00.

One could go on at some length describing the impressions of and uses for such books as these with their perhaps 95 per cent of photographs and 5 per cent of introductory text and captions. They are for the armchair traveler of course; they are also for the real traveler, to substitute for or at least to supplement (and serve as a check against) his own trip album. For school children, they will open the door to the incredible variety of life and scene in the world and no less, proportionately, in our own country. In this connection it should be noted that the emphasis in both books – more so in *Around the World* – is overwhelmingly on people and their architectural embellishments of the scene rather than on unencumbered nature. This is the impression formed by rapid riffling of pages and not substantiated by count. There is a natural apportionment here, at least in *Around the U.S.A.*: when more scenic views of nature pass the scanning eye, no second guess is needed to know you are in the West. In *Around the World* the selective camera has kept pretty well to the beaten tourist track: there is one minor view of Earth's crowning spectacle, the Himalayan ranges; the Andes are scarcely represented. These remarks are not in criticism; if one gets somewhat the impression of all the world's travel folders having been distilled into book form, the results are none the less fascinating. The printing may be commended for its exceedingly fine-screen and sharply clean offset impression.

View of Americans, without pictures

American Ways of Life. By George R. Stewart. Doubleday & Company, Inc., Garden City, New York. 1954. 310 pp., text maps and graphs. $3.95.

The University of California English professor who gave us a superb graphic and verbal cross-section of our country in *U. S. 40* has provided in *American Ways of Life* some instructive background reading on our folkways and their history. The study will enrich and intensify any broad and preferably somewhat leisurely travel view of the U.S. and its people. It will serve the stay-at-home reader in many ways by adding to his grasp and appreciation of our cultural heritage. It will – not the least of its values – also be found hugely entertaining, incidentally to its serious purpose which is "to present certain aspects of life in a particular nation, with special reference to the features that may be considered distinctive; and at the same time, to show how these distinctive ways of life have arisen historically, as the result of heredity and environment."

We'd like to load this with excerpts; space holds us to a bare table of subjects: land and people, language, religion, food, drink, clothing, shelter, sex, personal names, play, holidays, arts. One example, from "Food": tomato ketchup, or catsup – "However spelled, the product seems to fill some basic American dietary need. Mark Twain included it in his list of foods for which he hungered. It differs from most of the originally foreign foods by existing at the lower rather than the higher levels. In a 'good' restaurant, it will not be put on the table, and even to ask for it seems crass. The cheaper the restaurant, the commoner the ketchup bottle, and in many a hash-house and beanery it appears on the table as regularly as the pepper and salt, to be as freely used. It is the *vin compris* of the American workingman. . . ." Reflecting on several transcontinental bus trips and other journeyings through 44 states, we can recall the ketchup bottles marking our chow stops as regularly as red pins in a board-mounted road map. Long live that homely but piquant denominator of class distinction! D.G.K.

For the Poison Ivy League

Outdoor Hazards: *Real and Fancied.* By Mary V. Hood. The Macmillan Company, New York, 1955. viii + 242 pp. Drawings by Don Perceval. $3.95.

"A Guide to Out-of-Doors Safety for Campers, Hikers, Hunters, Fishermen, and Travelers in the United States" – the combination of title and quotation from the title page of this book provide excellent description of the overall content. Even a cursory glance through the pages reveals authentic information presented in a very appealing style and manner, and the intriguing drawings by Don Perceval illustrate ideas as well as things. This book will fill a long awaited need, especially for leaders of groups for young people and parents whose own youth was lacking in outdoor experiences. Even the complete novice in the

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"Keep the Desert Living"

EDITOR, *Pacific Discovery:*

Just before I left for a rather extended visit to Tucson I got a letter from Dr. John Thomas of the Dudley Herbarium protesting my suggestion that our off-shore islands be used for bombing practice, etc., rather than our desert areas ["Keep the Desert Living," editorial, *PD*, March-April 1956].

I know, of course, that San Clemente and San Miguel had been so "contaminated" by their extensive use by the armed services for purposes of this kind that I had them in mind when I made that suggestion in my article.

I would fight to the finish any attempt that might be made to take over the uncontaminated islands for such purposes. I regret that I did not make that clear in my article and as I wrote Dr. Thomas "my head is bloodied and very deeply bowed." HARRY C. JAMES

Lolomi Lodge, Banning, Calif., 15 May 1956.

"ways of the wild" will find understanding and consolation for unwarranted fears, as well as the more important knowledge of real hazards and how to deal with them.

The material is divided into sections, each in turn presented in orderly fashion, and includes both common and scientific names of the plants and animals discussed. Many suggestions are tucked in here and there about making use of some harmless creatures for exhibit purposes, such as in a camp museum. Twenty-six different "snake myths" are listed in a true-false manner, and only six are marked "true." Section IV is a rare digest of information about "The Camper and the Elements," and concludes with a short summary pointing out the fourteen *real hazards*, marked according to the part of the country through which the outdoor trail may lead. F. C. GOERGES

California Academy of Sciences
San Francisco

Forests, fishes, feathers, and fur

Our National Forests. By Bernard Frank. With a Foreword by Justice William O. Douglas. University of Oklahoma Press, Norman. 1955. xx + 238 pp., 48 photos, map. $4.

If you are going to be one of the 35 million or more persons who will use the national forests this year for some form of recreation, you will take to the woods better equipped after reading *Our National Forests.* You will know why and how we came to have *national* forests – preserves for the enjoyment and *use* of all the people, the key to which values is the "multiple-use idea." The relationship between those "inseparable resources," soil and water, will become clear. You will gain insights into modern scientific forestry, wildlife biology and management, the diversity of recreational uses, and the importance–in our crowded lives –of "solitude and inspiration." You will learn what interests would profit by the violation of principles which must be upheld if we would continue to have forests with all their varied resources which should benefit all for all time, not just a few for a short time.

Mr. Frank describes these forests in detail, the country over, telling what their prime resources are and what each offers to the vacationist. He also outlines the history and structure of their guardian, the U. S. Forest Service, telling how its men survey the timber and grazing lands under their care, how they manage them and protect them from fire, insects, disease, and human abuse.

Look at the map and see what portion of the United States the 180 million acres of these 148 national forests cover. Vacationer, timber user, or just plain citizen, you will see it worth while as well as a duty to know their story as this book gives it.

Seeing America's Wildlife, *In Our National Refuges.* By Devereux Butcher. The Devin-Adair Company, New York. 1955. viii + 338 pp., 351 photos, map. $5.00.

With the ever-increasing crowdedness of our favorite national parks and monuments comes a growing demand for other recreation areas, especially from those who want to get away from crowds and to a spot where they can enjoy nature undisturbed. Many such people may not have learned that there is open to them a national wildlife refuge system comprising nearly 280 distinct areas ranging from a few acres to more than 4,000 square miles in size. To acquaint all of us with this system and the wildlife species it protects, Devereux Butcher of the National Parks Association has written this comprehensive guide to the national refuges which is at the same time a beautiful pictorial catalog of our most splendid animals and birds. The 351 halftone photos in this book (which is printed entirely on high grade coated stock) are selected from our finest wildlife files – of the National Audubon Society, the U. S. Fish and Wildlife Service and other government agencies – or were taken by the author. They give the book a double value, which is enhanced by a complete index with pictorial references.

As may be expected from a man who has become a national conservation leader, Mr. Butcher's book is also an eloquent plea for the preservation of wild mammals and birds through education away from the "sport" of shooting and the business of trapping.

Among the host of writers conscientiously describing the universe for young readers – from the starry sky to the star on your friend the policeman's badge – one who talks straight to boys (has some of his own) is C. B. Colby, author of *First Fish,* and other *Firsts.* Three of his came in one package recently:

Fish and Wildlife: *The Story of the Work of the U. S. Fish and Wildlife Service.*

Tall Timber: *The Work, Machines and Men of the U. S. Forest Service.*

Park Ranger: *The Work, Thrills and Equipment of the National Park Rangers.*

All three are published by Coward-McCann, Inc., New York, 1955; have 48 photo-filled pages; and sell for $1.25 each.

Boys (and girls) of the several million American families who will hit the road this summer for the national forests, parks, and monuments, the state recreational areas, and others, will be helped to a far richer experience by such books as these. The texts are authentic; the photos are mainly from files of the Federal services, and full of action – buffalo roundup, seal tagging, trout planting, duck feeding by plane, clearing snow from roads, rescuing injured hikers, fire fighting (with smoke jumpers and bulldozers) – the rugged action kids love and understand. But beyond that, there is a manly appeal to the budding sense of values – the ideals of service these devoted Federal men so admirably exemplify; the appreciation and protection of wildlife; the preservation of wilderness (these books will doubtless inspire some youngsters to show their parents a thing or two about cleaning up a campsite, refraining from vandalism, and how not to start forest fires).

BOOKS BY MAIL

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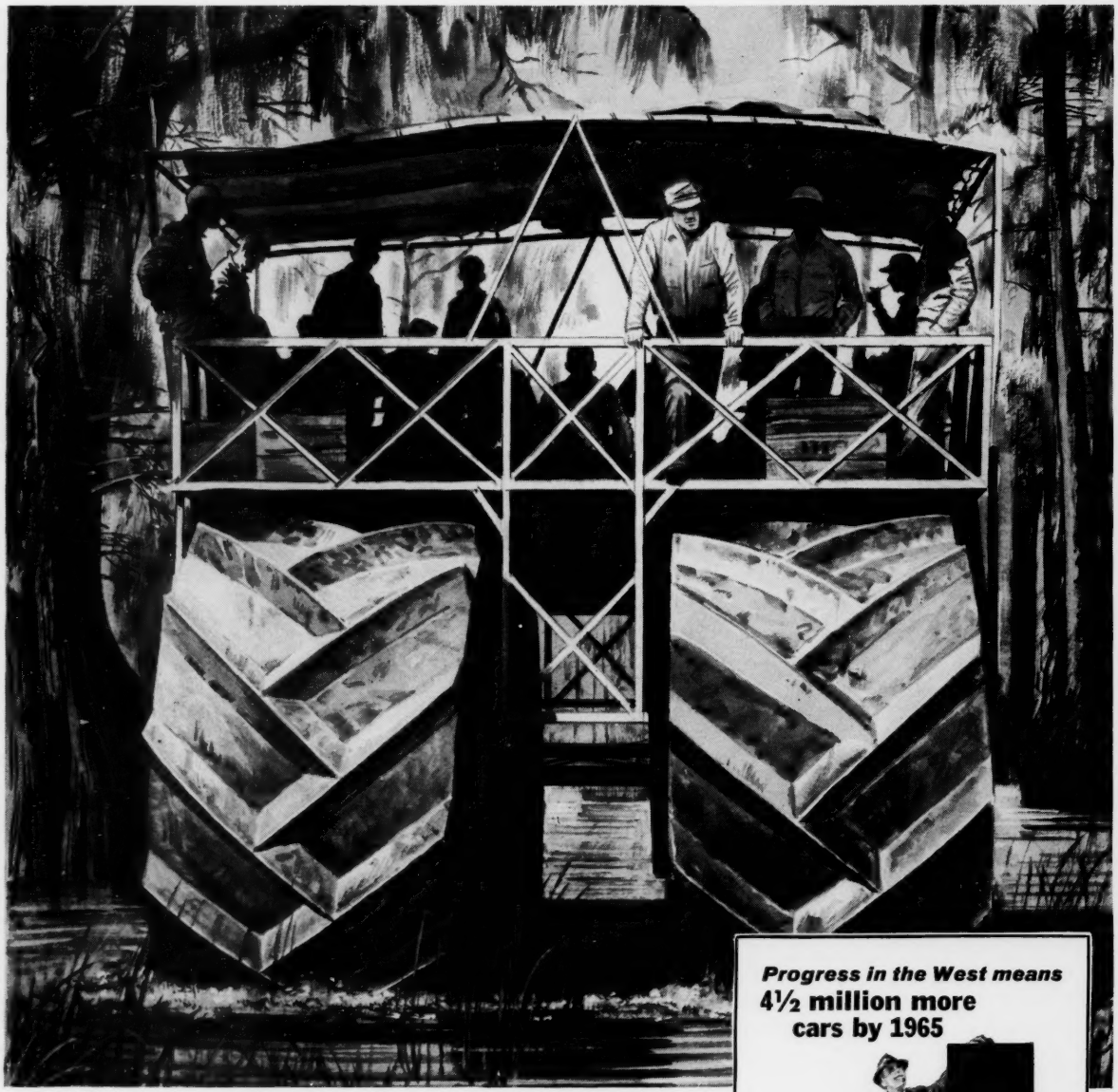

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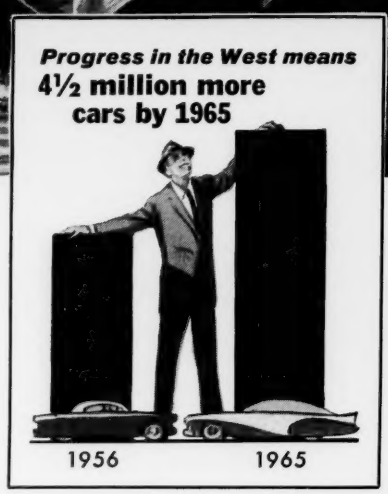

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